

**INFORMATION COMMUNICATION TECHNOLOGIES AS A SUPPORT
MECHANISM FOR LEARNERS EXPERIENCING READING DIFFICULTIES IN
FULL-SERVICE SCHOOLS**

by

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Submitted in accordance with the requirements for the degree of

DOCTOR OF EDUCATION

in the subject of

PSYCHOLOGY OF EDUCATION

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF N.M. NEL

JANUARY 2018

DECLARATION

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I Ramashego Shila Shorty Mphahlele, declare that **“Information Communication Technologies as a support mechanism for learners experiencing reading difficulties in Full-Service Schools”** is my own work, that all sources used or quoted have been indicated and acknowledged by means of complete references.

Signed:

A handwritten signature in green ink, appearing to be 'R.S.S Mphahlele', is shown within a light blue rectangular box.

R.S.S Mphahlele Date

ACKNOWLEDGEMENTS

The writing of this thesis has been inspiring and illuminating journey. I wish to express my earnest appreciation to the following individuals and institutions, who have contributed diligently to this significant journey.

- My supervisor, Professor Norma Nel has been inspirational, supportive and patient throughout my study and this life-changing journey. I sincerely appreciate your instrumental and professional guidance. Your commitment and constructive criticism made it possible for me to complete this study. Thank you again.
- To UNISA library staff, especially Ms Anemarie Strydom for addressing my research needs and for always notifying me about every library training.
- I wouldn't have done justice to the accuracy and quality to my work without the statistical inputs of Dr Helene Muller and Mr Nelson Masindi.
- To Dr Jacqui Baumgardt, kindly note that I am able to present this thesis with confidence because of your impressive editing abilities. I thank you.
- The Gauteng Department of Education for positive response to my research request.
- Tshwane South District office, thank you for opening the doors of your Full-service schools because that made this study a reality.
- To the Principals of the Full-service schools, School-Based Support Team members and Learning support educators, I appreciate your sincerity, passion and entrusted interest in this study.
- My friends and colleagues, especially Mrs Margaret Mahlase and Mr Gumani Mukatuni your words of encouragement and motivation are much appreciated.
- To my parents and siblings, your faith in me continued to motivate me to complete this study.
- To my partner, Victor and our children, Rocky and Toka, thank you so much for being pillars of my strength throughout this journey.
- Finally, I thank God almighty for the life, good health, courage and ability to complete this study.

ABSTRACT

Reading is an important skill that forms part of acquiring knowledge. It improves literacy levels, social skills, personal wellbeing and provides a sense of purpose. However, there are majority of learners experiencing reading difficulties around the world. The purpose of this study revolves around recent trends in academic underperformance that have led to a proliferation of studies which suggest that one of the greatest causes is reading difficulties. The Full-Service Schools (FSS) being part of the support strategy as denoted by Education White Paper 6 are primary schools that are equipped with most resources including Information Communication Technologies (ICTs). For this reason, they were selected so that the perceptions and experiences of their School-Based Support Team (SBST) members and Learning Support Educators (LSEs) can be explored, described and be explained when supporting learners experiencing reading difficulties. Through the concurrent triangulation mixed methods design data was collected using both quantitative and qualitative methods (that is the structured questionnaire, focus group interviews and official documents). The collected data was analysed through mixed analysis and merged to corroborate the findings from quantitative and qualitative data. Findings indicated that there was a small statistically significant difference in the reading performance of participants who were exposed to ICTs as a support mechanism for learners experiencing reading difficulties in the FSS. The slight improvement can be attributed to lack of ICTs guidelines for supporting learners experiencing reading difficulties, limited teacher training on ICTs and the limited use of the ICTs. In conclusion, the ICTs scaffolding guideline for teachers to support learners experiencing reading difficulties was developed. The guideline incorporated the three theories that unpinned this study namely the social interaction part of Vygotsky's sociocultural theory, the readers-response theory and e-reading theory. Throughout the ICTs scaffolding guideline, electronic text feature as part of the e-reading theory. It is the eradication of reading difficulties that can improve the learners' confidence which in turn will have a positive effect on their academic performance on some or all of the subjects.

Key terms: Reading, Full-Service Schools, Information Communication Technologies, reading difficulties, Learning Support Educators, School-Based Support Team, Barriers to learning and concurrent triangulation mixed methods.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADEA	ASSOCIATION FOR THE DEVELOPMENT OF EDUCATION IN AFRICA
ADHD	ATTENTION DEFICIT HYPERACTIVITY DISORDER
ANA	ANNUAL NATIONAL ASSESSMENT
CAPS	CURRICULUM ASSESSMENT AND POLICY STATEMENT
CBM	CURRICULUM-BASED MEASUREMENT
DBST	DISTRICT-BASED SUPPORT TEAMS
DGBL	DIGITAL GAME-BASE LEARNING
EFA	EDUCATION FOR ALL
EGRA	EARLY GRADE READING ASSESSMENT
FAL	FIRST ADDITIONAL LANGUAGE
FSS	FULL-SERVICE SCHOOLS
GBL	GAME-BASED LEARNING
GDE	GAUTENG DEPARTMENT OF EDUCATION
GPLMS	GAUTENG PRIMARY LANGUAGE AND MATHEMATICS STRATEGY
HRC	HUMAN RIGHTS COUNCIL
ICT	INFORMATION COMMUNICATION TECHNOLOGIES
IDEA	INDIVIDUALS WITH DISABILITIES EDUCATION ACT
IE	INCLUSIVE EDUCATION
ILST	INSTITUTIONAL LEVEL SUPPORT TEAM
IRI	INFORMAL READING INVENTORIES
ISP	INDIVIDUALISED SUPPORT PLAN
LOLT	LANGUAGE OF LEARNING AND TEACHING
MDG	MILLENNIUM DEVELOPMENT GOALS
MKO	MORE KNOWLEDGEABLE OTHER
NRP	NATIONAL READING PANEL
NRT	NORM-REFERENCED TESTS
OECD	ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT
PIRLS	PROGRESS IN INTERNATIONAL READING LITERACY STRATEGY
PISA	PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENTS

QUAL	QUALITATIVE
QUAN	QUANTITATIVE
RTI	RESEARCH TRIANGLE INSTITUTE
SACMEQ	SOUTHERN AND EASTERN AFRICAN CONSORTIUM FOR MONITORING EDUCATIONAL QUALITY
SAS	STATISTICAL ANALYSIS SOFTWARE
SDG	SUSTAINABLE DEVELOPMENT GOALS
SES	SENIOR EDUCATION SPECIALIST
SIAS	SCREENING, IDENTIFICATION, ASSESSMENT AND SUPPORT
SNA	SPECIAL NEED ASSESSMENT
SPSS	STATISTICAL PACKAGE FOR THE SOCIAL SCIENCE
UN	UNITED NATIONS
UNCRPD	UNITED NATIONS CONVENTION ON THE RIGHTS OF PERSONS WITH DISABILITIES
UNESCO	UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION
UNHRC	UNITED NATIONS HUMAN RIGHTS COUNCIL
UNISA	UNIVERSITY OF SOUTH AFRICA
USAID	UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT'S
WIF	WORD IDENTIFICATION FLUENCY
WSIS	WORLD SUMMIT ON THE INFORMATION SOCIETY
ZPD	ZONE OF PROXIMAL DEVELOPMENT

CHAPTER 1: INTRODUCTION

“Reading is a starting step of many things, which build a more solid stairs for you to climb up achieving something big out there”.

(Longo, 2013:122)

1.1 INTRODUCTION TO THE STUDY

Reading, according to Abraham and Gram (2012:2), is an important skill that forms part of acquiring knowledge and opens up worlds of opportunities. Reutzel and Cooter (2010:25) define it as understanding the meaning of printed or written material and a means of language acquisition, communication, and sharing information and ideas. Having that in mind, it can be stated that reading exposes one to new things, helps with self-improvement and understanding of the world around. Farrall (2012:7) holds a similar view by explaining that reading prepares one for actions and decision-making and it is a tool for communication. She further concluded by indicating that it also boosts imagination and creativity.

Despite the importance of reading, data from several sources such as National Research Council¹ (NRC, 2016), and United Nations Educational, Scientific and Cultural Organization² (UNESCO, 2015) reveal that majority of learners around the world are experiencing reading difficulties. Much of the literature including UNESCO (2015) emphasises that since the mid-1990s, the number of illiterate persons has rapidly increased around the world, which is believed to be caused by reading difficulties.

It is my experience of working as a primary school teacher for a period of twelve years, and six years as a Senior Education Specialist (SES) in the Inclusion and Special Schools Unit in the Gauteng Department of Education (GDE) that has driven this research. One of my roles as the SES was to support learners experiencing barriers to learning. Barriers to learning are difficulties that arise within the education system as a whole, the learning site and/or within the learner him/herself. They prevent access to learning and development for learners (Department of Basic Education [DBE],

¹ NRC is an American non-profit, non-governmental organization that produces reports that shape policies, inform public opinion, and advance the pursuit of science, engineering, and medicine.

² UNESCO is a Scientific and Cultural Organisation that contributes to peace and security in the world by promoting collaboration among nations through education, science, culture and communication.

2014a:7). During visits to the schools (with the aim of supporting learners experiencing barriers to learning), the following aspects became apparent:

- Reading difficulties appeared to be the dominant barrier among other barriers to learning that learners experienced.
- There were different support strategies including Full-Service Schools (FSS) to address reading difficulties and other barriers, which were experienced by different learners.

The FSS as a support strategy, which is discussed in detail below, piqued my interest in exploring the support of intermediate phase (Grade 4-6) learners experiencing reading difficulties in Gauteng Province of South Africa. In the context of this study, the FSS is a primary school that is equipped and supported by the DBE to provide for the full range of barriers to learning among all learners (DBE, 2009:1; Department of Education [DoE], 2001:22). I am interested in establishing how learners experiencing reading difficulties are supported in the FSS.

This study aims to contribute to this growing area of research by exploring the use of Information Communication Technologies (ICTs) as a support mechanism for learners experiencing reading difficulties in the FSS. Both ICTs and FSS are explained in detail below.

1.2 BACKGROUND TO THE STUDY

The central thesis of this study revolves around recent trends in academic underperformance that have led to a proliferation of studies (such as Esbrandt & Hayes, 2012; Siqueira & Gurge-Giannetti, 2011) which suggest that one of the greatest causes of underperformance is reading difficulties. Reading difficulties are described by Shanker and Cockrum (2009:3) as having difficulty learning to read, while Gunning (2010:2) defines reading difficulties simply as problems with reading. Further, Rasinski, Padak and Fawcett (2010:2) define reading difficulties as lack of development of essential reading elements. A broader perspective has been adopted by Dednam (2011a:150) who describes reading difficulties as difficulties with analysing words into phonemes and morphemes and with identifying the rhythm and syllables of words and sentences. Drawing from the aforementioned definitions, reading difficulties are viewed as the inability to read at the level of educational expectations.

Taking cognisance of these definitions, we need to be concerned about the reading situation when we study the dismal results of literacy surveys conducted by prominent organisations/associations around the world. The two organisations discussed below are not the only ones performing evaluations or surveys in different countries. However, I discuss the selected two below because they are the most well-known.

1.2.1 Current status of reading difficulties globally

The first organisation is Programme for International Student Assessments (PISA). PISA is a survey, which is conducted every 3 years and has been designed to collect information on the reading, mathematics and science competencies of 15-year-old learners in participating countries. The participating countries are members of the Organisation for Economic Cooperation and Development (OECD) and include Albania, Argentina, Belgium, Canada, Denmark, Estonia, Hong Kong- China, Iceland, Luxembourg, Netherlands, New Zealand, Norway, Poland, Qatar, Spain, Sweden, Tunisia, United Kingdom and United States of America to mention but a few (OECD, 2017:6).

In 2012, PISA involved 65 countries and in 2015, 72 countries to test learners' competencies in reading, Mathematics and Science. (South Africa did not participate.) The technical report of PISA 2012 study, which was released in 2014, indicated that only 8% of the learners were top performers on PISA's reading levels while 92% of the learners performed below 50%. According to Jackson and Kiersz (2016:3), when comparing the reading scores of 2012 and 2015 studies, there is no significant difference. The results of PISA 2015 indicated that approximately 20% of learners in OECD countries, on average, do not attain the baseline level of proficiency in reading. This percentage has remained stable since 2009. The report also pointed out that on average, across OECD countries, the gender gap in reading in favour of girls narrowed by 12 points between 2009 and 2015: boys' performance improved, particularly among the highest-achieving boys, while girls' performance deteriorated, particularly among the lowest-achieving girls. The next administration of PISA will be in 2018.

The second organisation is Progress in International Reading Literacy Strategy (PIRLS). PIRLS is an international study of reading literacy, which is conducted every 5 years. It started with about 45 countries including South Africa. It examines the processes of comprehension as well as reading fluency for learners between the age

of 9 and 10 (Grade 4-6 learners). Reading comprehension and fluency do not function in isolation from each other, as they form the basis of the written test (Howie, Combrinck, Roux, Tshele, Mokoena & McLeod Palane, 2016:1)

The study conducted between the years 2006-2010, where 71 countries including South Africa took part, indicated that 65% of the learners who participated could not read at the appropriate level of their age. A detailed examination of PIRLS results by Martin, Mullis and Foy (2016:54-57) shows the reading difficulties trends over a 15-year period (2001, 2006, 2011 and 2016) which provide evidence to suggest that there are countries (such as South Africa Bulgaria, Lithuania, the Netherlands and Sweden) where learners are still experiencing reading difficulties.

1.2.2 Status of reading difficulties in sub-Saharan Africa

Of particular significance for this study, is The Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ), which was formed in 1995 by 15 Ministries of Education in 10 countries around Africa. The countries were: Kenya, Lesotho, Malawi, Namibia, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. SACMEQ was officially launched in late 1995 and was given continuing long-term support through the generous assistance of the Government of the Netherlands. SACMEQ conducts a survey every 5 years (Ross & Postlethwaite, 1992:2).

To date, SACMEQ has conducted four nationally representative school surveys in participating countries, namely, SACMEQ I (1996), SACMEQ II (2000), SACMEQ III (2007) and SACMEQ IV (2013). These surveys collect extensive background information on the schooling and home environments of learners, and in addition, test learners and teachers in both numeracy and literacy. South Africa participated in SACMEQ II (2000), SACMEQ III (2007) and SACMEQ IV (2013).

For this study, I focus on the SACMEQ III and IV Projects whose reports were released between the years 2006 and 2016. According to the SACMEQ IV report, from 2013 to 2014, there were some performance gains in other countries as far as reading is concerned compared to SACMEQ III where reading performance dropped in 2007. It may, however, be noted that this improvement is very slight in some countries such as Mauritius, Seychelles and Zimbabwe. These three countries recorded improvement of very low points (against 500 SACMEQ centre point) as illustrated Figure 1.1:

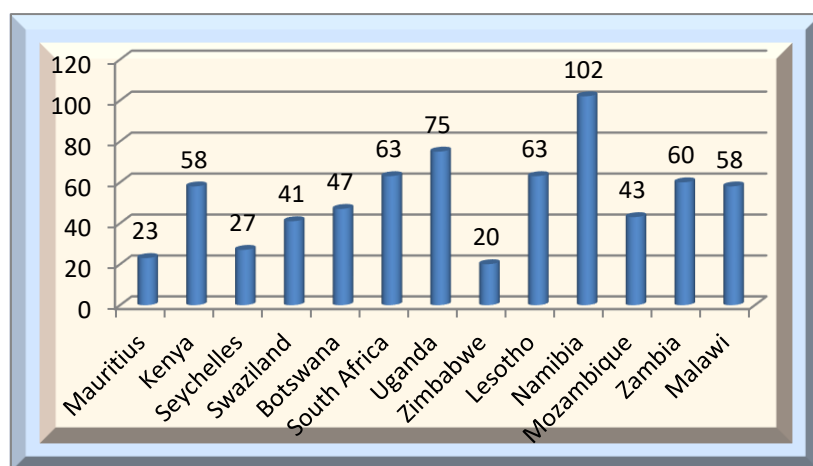


Figure 1.1: Reading performance gains between 2006 and 2016

Source: Bandi (2016: 2)

The performance gains illustrated in Figure 1.1 are the differences between learner reading scores of SACMEQ IV and III. According to Figure 1.1, only two countries (Namibia and Uganda) within SACMEQ had more significant increases than other countries. They obtained 102 and 75 points respectively. Although it was noted in SACMEQ IV report that Seychelles outperformed all the countries in SACMEQ IV survey, it should also be noted that the performance gain between SACMEC III and IV is only 27 points. Even though the SACMEQ countries experienced positive performance gains as illustrated in Figure 1.1, this improvement is not satisfactory for the 10-year period. The results from PISA, PIRLS and SACMEQ provide important insights into the reading difficulties experienced by learners around the globe.

Turning now to South Africa, as the country where this study is conducted, SACMEQ III results revealed that the number of learners with acceptable reading skills was 51.7% and the number increased to 55.8% during SACMEQ IV (Moloi & Chetty, 2010:42). These results resonate with the performance gain for South Africa which is illustrated in Figure 1.1. The raw reading scores for SACMEQ III and IV were 495 and 558 respectively. Drawing from the comparison of SACMEQ III and IV for South Africa, it is safe to conclude that about 45% of learners are experiencing reading difficulties. The situation of reading difficulties in South Africa is discussed in more detail below.

1.2.3 The situation of reading difficulties in South Africa

Having the illustration of the number of learners experiencing reading difficulties in South Africa from the SACMEQ survey results above, it should be noted that South Africa does not rely only on SACMEQ for literacy and mathematics evaluation. In 2011, the Annual National Assessment (ANA) initiative was introduced. This is a standardised, annual, national assessment for languages and mathematics in the foundation, intermediate and senior phases (Grades 1-6 and 9). The assessment focuses on literacy and numeracy for Grades 1-3, and on mathematics and languages in Grades 4-6 and 9. The scores for ANA are used to benchmark and generate standardised evidence for monitoring learners' progress and to lay solid foundations for learning.

Another purpose of ANA was to evaluate whether learners in specific grades are developing literacy and mathematics skills at the appropriate levels. Furthermore, ANA provided teachers with a variety of methods and techniques of assessing to prepare informed and appropriate support mechanisms. Unlike examinations that are designed to inform decisions on learner promotion and progression, ANA findings are utilised for both diagnostic purposes at individual learner level and decision-making purposes at a systemic level. The results of ANA helped teachers mainly to identify relevant support mechanisms to improve learner performance (DBE, 2014b:8).

It has commonly been assumed that reading difficulties are more evident in the learning of languages because they involve spelling, comprehension and lots of reading. In Gauteng Province, where this study was conducted, ANA results for languages in the period of three years, that is 2012, 2013 and 2014 indicated that reading difficulties may be experienced by most learners as reflected in Table 1.1.

Table 1.1: Summary table for ANA First Additional Language achievement rates in 2012, 2013 and 2014.

Grade	First Additional Language 2012	First Additional Language 2013	First Additional Language 2014
4	34%	39%	41%
5	30%	37%	47%
6	36%	46%	45%
9	35%	33%	34%

Adapted from DBE (2014:9)

As shown in Table 1.1, I considered only the results of First Additional Language (FAL), namely, English, because English is regarded as the Language of Teaching and Learning (LOLT) mostly from Grade 4 onwards. The DBE, (2014b:10) posits that a 50% or higher test score is regarded as an acceptable level of competency. This is aligned to the current South African curriculum, known as the Curriculum Assessment and Policy Statement (CAPS) where a mark of at least 50% is required for adequate and higher achievement. Being a single, comprehensive, and concise policy document, CAPS has replaced the Subject and Learning Area Statements, Learning Programme Guidelines and Subject Assessment Guidelines for all the subjects listed in the National Curriculum Statement Grades R-12 since its implementation in 2012 (DBE, 2011:1).

Table 1.1 shows that learner performance in FAL levels in all grades have remained below 50%. In response to these results, the GDE, which is the province where this study took place, introduced an intervention plan in the form of a strategy named Gauteng Primary Language and Mathematics Strategy (GPLMS). The strategy was introduced in 2010 in Grades 1-3 in 800 primary schools in the Gauteng Province. I discovered that the strategy only included the use of extra worksheets and extra textbooks, which was just a perpetuation of the problem.

The case study conducted by Bonney (2015:25) revealed the ineffectiveness of the use of lecture methods, with emphasis on textbook reading assignments accompanied by worksheets completed by learners in improving learner performance. On the other hand, a study carried out by Singleton (2009:6) investigated the support of learners experiencing reading difficulties and his findings indicated that learners experiencing reading difficulties need an enhanced teaching with a phonic element. He then recommended a need for multi-sensory programmes that target phonic knowledge. Although there was some improvement in Grade 4-6 in 2013 and 2014, I am driven by the need for an investigation with regard to the integration with other support mechanisms such as ICTs.

Research that is more specific is needed concerning support mechanisms for reading difficulties, and how ICTs can bring the academic results of the learners to the acceptable level of competency. Most learners are conversant with ICTs and use them mostly to communicate and to search for information, which can be useful and

effective when used for supporting learners experiencing reading difficulties. This is confirmed by findings of one of the studies conducted by PISA where they found that in most OECD countries, more than 80% of 15-year-olds use computers frequently yet most do not use them much in school (Groff, 2013:2)

In the light of the above, consideration of inclusive education is vital seeing that South Africa and other developing countries around the globe embarked on eradication of illiteracy through inclusive education as one of the highly recommended models. Nel, Tlale, Engelbrecht and Nel (2016:5) posit that provision of support to learners experiencing barriers to learning including reading difficulties is an important aspect of inclusive education (IE). What follows is an account of supporting learners experiencing reading difficulties in relation to inclusive education.

1.2.4 Inclusive education: supporting learners experiencing reading difficulties

IE is implemented worldwide as confirmed by Rieser (2013:133) who points out that 148 countries including the European Union have ratified the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), and 158 have adopted the Convention. In December 2013, a report of the United Nations Human Rights Council (UNHRC), 'Thematic study on the rights of persons with disabilities to education', made it clear that, IE is one of the key provisions of the UNCRPD, so much so that in March 2014, the Human Rights Council (HRC) passed a resolution urging more to be done to implement the right to IE.

IE has been on the South African Education agenda since 1994. The World Conference on Special Needs Education, Salamanca, Spain influenced it in June 1994, where 92 governments and 25 international organisations were represented. South Africa was part of the agreement on a dynamic new statement on the education of all learners with barriers to learning including reading difficulties and called for inclusion to be the norm by introducing Education White Paper 6 (EWP6): Building an inclusive education and Training System in 2001. The EWP6 was not just a response to Salamanca world conference, but it was also a response to the post-apartheid state of special needs and support services in education and training of South Africa (DoE, 2001:1).

The IE is highly recommended in the EWP6 and is aimed at making education accessible to all learners no matter what their individual needs or barriers to learning

are. One positive implication of this recommendation is that it would permit/afford all learners, (including those experiencing reading difficulties), to develop and extend their potential and participate as equal members of society (Maguvhe, 2015:183).

The EWP6 emphasise the roles of FSS, School-Based Support Teams (SBSTs), District-Based Support Teams (DBSTs)³, Learner Support Educators⁴ and is discussed in detail in chapter 2. The context of FSS in this study is explained in the introduction above, and it should be noted that in Gauteng Province, where this study was conducted, 75 FSS have been established in 15 District offices since the year 2012. Even though the FSS make up to only 5% of the primary schools in Gauteng, it is safe to conclude that they are included in the results shown in Table 1.1.

The FSS, being part of the support strategy as denoted by EWP6, accommodate learners who require moderate levels of support. Learners who require low levels of support are accommodated in the ordinary schools while those who require high levels of support are accommodated in special schools. The different levels of support as required by different learners in the schools are outlined in Figure 1.2.

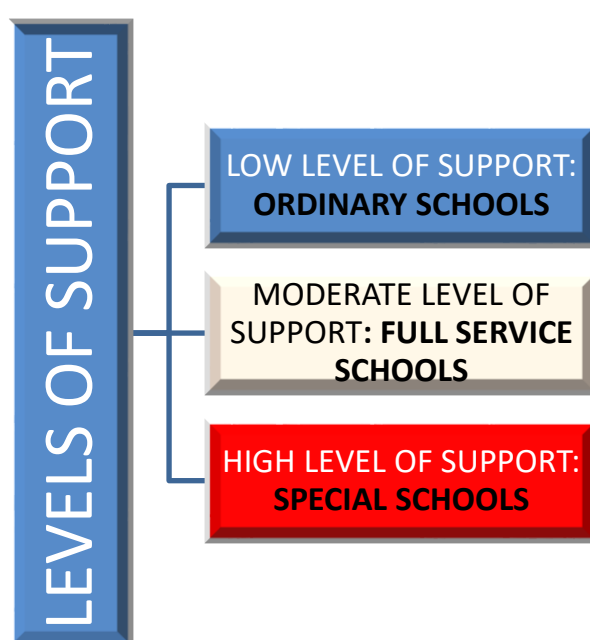


Figure 1.2: Levels of support

³ The SBSTs and the DBSTs are teams at the schools and District Offices which help to introduce strategies and interventions that will assist educators in the mainstream school system to cope with a diversity of learning and teaching needs (Department of Education, 2005:6)

⁴ Learning Support Educators are those teachers who have specialised competencies to support learners experiencing barriers to learning (Mahlo, 2011:16)

Figure 1.2 illustrates that ordinary schools provide low levels of support to learners experiencing barriers to learning. The DBE (2009:26) asserts that ordinary schools are mostly supported by the District Support Team⁵ (DBST) through building capacity of teachers and SBST members on short-term or once-off consultative support around individual cases. Learners who require low levels of support are mainly those who experience barriers arising from the curriculum (such as inflexible teaching and learning methods), and some emotional problems that require short-term therapeutic support.

As indicated in Figure 1.2, FFSs should provide support to learners requiring moderate levels of support. It should, however, be noted that the FSS do not encourage the admission of learners who experience barriers to learning from neighbouring schools, but rather provides guidance to the referring schools (DBE, 2009:18). Learners who require moderate levels of support are those experiencing learning difficulties (such as reading, writing and mathematical difficulties), hard of hearing, nearsightedness, farsightedness, astigmatism and presbyopia, Attention Deficit Hyperactivity Disorder, behavioural problems and other medical conditions (such as epilepsy).

According to the DoE (2007:6), learners who require high level of support are learners who experience the following: severe learning difficulties, hearing loss (mostly deaf), and vision loss (mostly blind), mobility, language use and social communication, complex, multiple and pervasive disability, behaviour and psychosocial factors, social and economic neglect. These learners must be admitted to special schools.

The FSS are central to this study because they are equipped with extra resources to support the learners who need a moderate level of support such as those who experience reading difficulties. The resources include computer laboratories built by the GDE which are furnished with a variety of ICTs such as computers, internet access, television and smart boards. To date, little research has been done on the 75 schools that were identified to be converted to FSS in the Gauteng Province (which are still being piloted).

⁵ District Based Support Team is a team established at the District Office to provide coordinated professional support service that draws on expertise in further and higher education, local communities, targeting Special Schools, designated Full Service Schools and other primary schools (DoE, 2001: 8).

1.3 PRELIMINARY LITERATURE REVIEW

The literature review for this study is structured in two sections: The first section looks into what reading entails and explores the scope of reading skills, prerequisites of reading and how reading difficulties manifest. Various support mechanisms that are used to support learners experiencing reading difficulties in the FSS are identified and explored. ICTs as support mechanisms for learners experiencing reading difficulties are investigated in terms of how they add value to the support mechanisms available in the FSS.

The second part focuses on the theoretical framework that underpins this study. Three theories served as the pillars for this study, namely, sociocultural theory (Vygotsky, 1978), readers-response theory (Gunning, 2013), and e-reading theory (Ortlieb, 2014).

1.3.1 Vygotsky's sociocultural theory: zone of proximal development

The focus of this study on Vygotsky's sociocultural theory is on the zone of proximal development (ZPD) which is the second aspect of this theory. The ZPD is defined by McLeod (2012:6) as the difference between what a learner can do without help and what he or she can do with help. With regard to the ZPD, the learner is provided with scaffolding to support his/her evolving understanding of knowledge domains or development of complex skills (Vygotsky, 1978b:34). Vygotsky further highlights that the sociocultural environment presents the learner with a variety of tasks and demands and engages the learner in his world through the tools, which, in the context of this study, are the ICTs.

According to Waller (2002:5), the potential of ICTs is rarely realised because the effective use of software is dependent on the teacher providing appropriate support or 'scaffolding' for learning. He further argues that talking books (as part of ICTs) are used most effectively to support reading with the teacher, not as a replacement for the teacher. On the other hand, Moore (2005:19) brings to our attention that ICTs on their own do not enhance learning; teachers need to incorporate ICTs very carefully into the curriculum. The significance of the scaffolding in this study is evident where the teacher supports learners experiencing reading difficulties by facilitating their reading activities using ICTs. During this facilitation of learning, learners need to move from

one reading level to the next until they reach the level of independence. The different levels of reading are discussed in detail in chapter 2 of this study.

1.3.2 Readers-response theory

Probst first introduced readers-response theory in 1998, explaining how the learner can have a dialogue with the text. Gunning (2013:436) built on what Probst explained which is having a dialogue with the text, by suggesting a way to elicit readers-response for positive reading outcomes. He describes four general steps which are discussed in detail in chapter 2 of this study, namely: creating a reader-response environment; preparing to read a literary piece; reading a literary piece, and small-group discussion.

In support of the readers-response theory, Kramsch (2015:454) views reading as a process, not a product. He signified reading as the intersection between the reader (the learner) and the text. He perceived a contradiction between teaching literature as product and teaching language as process and elaborated that when learners read they relate the new to the old by employing conceptual strategies (top-down) or surface-level operations (bottom-up). These strategies are described in detail in the first section of chapter 2 of this study.

Readers-response theory involves small-group discussions with peers and, in relation to the ZPD as highlighted by Turuk (2008:249), learning arouses a range of internal developmental processes that can operate only when learners interact with people in their environment and in cooperation with their peers. The relationship between Vygotsky's sociocultural theory and the readers-response theory is described in detail in the second section of chapter 2 of this study.

1.3.3 e-Reading theory

The e-Reading theory as introduced by Ortlieb (2014:01) outlines how reading in electronic formats differs from traditional reading of print. Ortlieb (2014:245) emphasises that with the varied text structures and interactive text features, attention turns to the theoretical foundations that underpin digital literacy learning today. He also explains how information is sought and retrieved when reading new information from digital media: this is outlined in detail in chapter 2.

According to Ortlieb (2014:247), when using e-Reading theory, teachers should address the current digital literacy needs of their learners, thus preparing them for

challenges in the 21st century. He further stresses that varying text structures within digital formats are the scaffolds, and ultimately, that these scaffolds can be withdrawn as the learners become more proficient.

1.3.4 Combining the theories into a theoretical framework

It is worth noting that scaffolding is the common factor in the three theories. This commonality is illustrated in Figure 1.3.

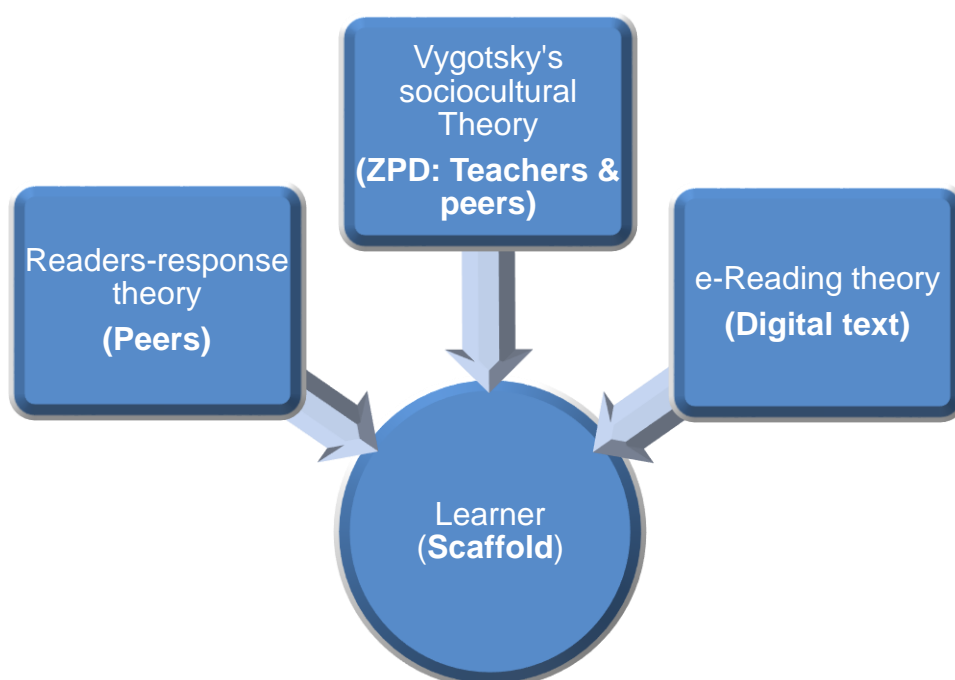


Figure 1.3: The relationship between Vygotsky's sociocultural theory, readers-response theory and e-Reading theory

In Figure 1.3, the learner is at the centre of the three theories and is supported through scaffolding. According to Vygotsky's sociocultural theory (ZPD), teachers and peers form part of the scaffold while in the case of the readers-response theory, peers in the small-group discussions form part of the scaffold. In the case of the e-Reading theory, digital text is regarded as the scaffold. Figure 1.3 shows that the teacher, peers and digital text can be used jointly. The collaboration is outlined in detail in chapter 2 of this study.

1.4 PROBLEM STATEMENT

It is still a matter of concern that reading difficulties persist among learners in the schools and in the FSS, despite FSS supposedly having extra resources and services, e.g. Learning Support Educators (LSE), different therapists and social workers. Therefore, it can be concluded that learners experiencing reading difficulties in the FSS, even though they receive more support, will not be able to learn effectively and, in the long run, they might be unable to participate adequately in cultural, economic, political and educational activities of the country.

In trying to address this problem, this study employed a mixed methods approach to explore, describe and explain the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties. A concurrent triangulation mixed methods design was used, and it is a type of design in which different but complementary data was collected on the same topic. In this study, structured questionnaire (quantitative instrument) was used to establish the effects of ICT support that predicts that the use of ICTs (independent variables) will influence (positively, negatively) the reading performance of learners experiencing reading difficulties. Concurrent with this data collection, qualitative focus group interviews explored participants' interpretation and description of the role of ICTs in supporting learners experiencing reading difficulties. The reason for collecting both quantitative and qualitative data are to bring together the strengths of both forms of research to corroborate results.

In the light of the above problem and purpose statements, the following research questions were formulated to map the study and the hypotheses formulated for acceptance or rejection.

1.5 RESEARCH QUESTIONS AND HYPOTHESES

In the light of the problem statement of the study, the main research question and secondary research questions were formulated as follows:

1.5.1 The main research question

What role do ICTs play in supporting learners experiencing reading difficulties in the selected FSS?

1.5.2 Secondary research questions

- What are the experiences of SBST members and LSEs regarding the use of ICTs in supporting learners experiencing reading difficulties in FSS?
- How effective is the use of ICTs in FSS in supporting learners experiencing reading difficulties compared to other support mechanisms?
- What guidelines can be developed for ICTs learner support for learners experiencing reading difficulties in FSS?

1.5.3 Hypothesis

To establish the effects of ICTs as a support mechanism for learners experiencing reading difficulties in FSS, the following hypotheses are formally stated:

Null hypothesis: H_{0m} : There is no statistically significant difference in the reading performance of participants who were exposed to ICTs as a support mechanism to support learners experiencing reading difficulties in FSS.

Alternative hypothesis: H_{1m} : There is a statistically significant difference in the reading performance of participants who were exposed to ICTs as a support mechanism to support learners experiencing reading difficulties in FSS.

The research questions and hypotheses serve as a guide to achieving the aims and objectives mentioned below:

1.6 AIM AND OBJECTIVES

The main aim of this study is to explore, describe and explain the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties to improve their levels of academic achievement in FSS.

In support of and to realise the main aim of this study, the following general objectives are addressed:

- To explore, describe and explain the experiences SBST and LSEs regarding the use of ICTs in supporting learners experiencing reading difficulties.

- To explore and describe the effectiveness of ICTs against other support mechanisms currently being used in the FSS to support learners experiencing reading difficulties.
- To develop guidelines for using ICTs as a support mechanism for learners experiencing reading difficulties.

To achieve these aims and objectives and to be able to contextualise the findings of this study within the larger body of research, I used the research methodology outlined below.

1.7 RESEARCH METHODOLOGY

Research methodology according to Rajasekar, Philominathan and Chinnathambi (2013:5) is a systematic way of solving a problem. It is also regarded as the work plan for the research. According to Babbie (2011:32) and Creswell (2009:8), a research study should lead to a systematic description of reality. Thus, for this study, the research methodology serves as a foundation for answering the research question, accepting or rejecting the hypothesis. As indicated in section 1.6, research methodology in this study shaped the process of exploring, describing and explaining the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties to improve their levels of academic achievement in the FSS.

In justifying the statement mentioned above, this section explains how I moved from a paradigm (worldview/assumption) into the research methodology (reality). The journey started with the paradigm, which is the fundamental frame of reference, or worldview that underlies theories and inquiry.

1.7.1 Research paradigm

Paradigm refers to approaches that emphasise the meaningful nature of people's participation in social and cultural life (Creswell, 2009:8). According to Kandel (2007:8), a paradigm relates to a world that is interpreted through the mind. In this study, a paradigm is viewed as a worldview that provides a logical framework for exploring the theories. Creswell (2009:6) refers to a paradigm as a philosophical approach which can take the form of positivism, constructivism/interpretivism, advocacy/participatory and pragmatism. Mackenzie and Knipe's (2006:2) paradigms

relate to Creswell's paradigms but other aspects such as transformative, emancipatory, critical, and deconstructivist approaches are added.

Some researchers (Mackenzie & Knipe, 2006:6; Mertens, 2005:12; Creswell, 2003:9) suggest that it is the paradigm and the research question, which should determine which research data collection and analysis methods, are most appropriate for the study. However, they provide some indications of the way in which research methods cross paradigm boundaries as illustrated in Table 1.2.

Table 1.2: Paradigms, methods and tools

Paradigm	Suitable Research Method (Primarily)	Data Collection Tools (Examples)
Positivism/ Post-positivism	Quantitative methods predominate although qualitative methods can be used.	Experiments Quasi-experiments Tests Scales
Interpretivism/ Constructivism	Qualitative methods predominate although quantitative methods may also be utilised.	Interviews Observations Document reviews Visual data analysis
Transformative	Qualitative methods with quantitative and mixed methods. Contextual and historical factors described, especially as they relate to oppression.	A diverse range of tools needed to avoid discrimination; for example, sexism, racism and homophobia.
Pragmatism	Qualitative and /or quantitative methods may be employed. Methods are matched for the specific questions and purpose of the research.	May include tools from both positivist and interpretivist paradigms. For example, interviews, observations, testing and experiments.

Adapted from: (Mackenzie & Knipe, 2006:5; Mertens, 2005:12; Creswell, 2003:9-10)

It can be seen from Table 1.2 that the positivist or post-positivist paradigm tends to predominantly use quantitative methods or data collection and analysis, though not necessarily exclusively, while the interpretivist/constructivism paradigm generally operates using predominantly qualitative methods (Bogdan & Biklen, 1998:22; Burns, 1997:11; Cohen & Manion, 1994:36; Glesne & Peshkin, 1992:9; Mertens, 1998:28; Silverman, 2000:154; Wiersma, 2000:45).

Table 1.2 also illustrates that the transformative paradigm provides an opportunity to combine multiple methods, different worldviews, and different assumptions, as well as

different forms of data collection and analysis in a mixed-methods study. Likewise, the pragmatic paradigm allows for the application of both qualitative and quantitative research methods. I, therefore, conclude that it may be possible for any and all paradigms to employ mixed methods rather than being restricted to any one method, which may potentially weaken and unnecessarily limit the depth and richness of a research study.

Guided by the information on Table 1.2 and the theoretical framework that underpins this study; the most suitable paradigm for this study is constructivism. In the literature, researchers tend to use the terms constructivism and 'constructivist paradigm' interchangeably. For the purpose of this study, the term 'constructivism paradigm' was used. According to Pitsoe (2007:135), the constructivism paradigm was the brainchild of Dewey, Bruner, Vygotsky and Piaget, and can be regarded as the conventional philosophy of learning that is founded on the premise that we all construct our own understanding of our world, which is influenced by our experiences. Pitsoe further agrees with Dewey, Bruner, Vygotsky and Piaget that the constructivism paradigm emphasises discovery, experimentation and open-ended problems that have been successfully applied in mathematics, science, reading, writing and other subjects. That resonates with this study as it aims to explore the effectiveness of the use of ICTs for supporting learners experiencing reading difficulties.

Recent developments in the constructivism paradigm have led to the findings that it is not a homogenous paradigm (Riegler, 2012:237) and it has various strands of empirical insights and philosophical reflections. Forms of constructivism paradigms are personal constructivism as described by Piaget (1971:36); social constructivism as outlined by Vygotsky (1978b:34); radical constructivism as advocated by Glasersfeld (1995:113) and educational constructivism as put forward by Mathews (1998:16).

Paramount in this study is Vygotsky's social constructivism, which is also termed socio-culturalism. This study is influenced by Vygotsky's sociocultural theory, which is outlined in detail in chapter 2 of this study. Social constructivism as described by Glasersfeld (1989:121) emphasises that the learner needs to be actively involved in the learning process, unlike traditional educational practice where the responsibility rested with teachers to teach and learners played a passive role. This links up with the

use of ICTs because the learner plays a more active role when using ICTs. Social constructivism is outlined in detail in chapter 3 of this study. In order to plan and broaden the selected research paradigm, it is necessary to select a suitable research approach.

1.7.2 Research approach

For the researcher to move from a paradigm to the empirical study, relevant research skills, assumptions and practices should be used. The research approach can be defined as a plan and procedure that consists sets out a detailed method of data collection, analysis and interpretation (Lincoln, Lynham & Guba, 2011:103). Extensive research has shown that there are several types of research approaches. Creswell, (2011:257) states that there are three recognised research approaches for the procedures for conducting research: quantitative, qualitative and mixed methods. McMillan and Schumacher (2010:21) accept the three main research approaches; but add a fourth approach, namely, the analytical approach.

For this study, the mixed methods approach was selected based on the following reasons provided by Delport and Fouché (2011:436):

- To simultaneously address a range of confirmatory and exploratory questions with both qualitative and quantitative approaches.
- To eliminate various kinds of bias that may be encountered to improve various forms of validity or quality criteria.

These intentions can be met by using an appropriate/suitable research design.

1.7.3 Research design

Research design is described by McMillan and Schumacher (2010:20) as the procedures for conducting the study, and includes a consideration of all the conditions affecting how the data should be obtained (for example, time and place). On the other hand, Fouché and Delport (2011:109) indicate that research design focuses on the end product and includes all the steps in the process to achieve the anticipated outcome of the study. I, therefore, view research design as a strategic framework for action that connects the research questions with the collection and analysis of data.

1.7.3.1 The selected design

A concurrent triangulation mixed-methods design was selected as the most appropriate suitable for the constructivism paradigm that underpins this study. Creswell, Plano Clark, Gutmann, and Hanson, (2003:209) present five mixed methods design: sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation, concurrent nested and concurrent transformative.

I found the concurrent triangulation mixed-method design to be relevant for this study not only because of this study's paradigm but because it helped in obtaining different but complementary data on the same topic (Morse, 1991:122). The design was selected in order to be able to compare and contrast quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative data (Creswell 2007: 62; Mertens & Hesser-Biber, 2012:75). The views and the perceptions of SBSTs and LSEs were explored, described and explained in relation to the use of ICTs in supporting learners experiencing reading difficulties. The design is illustrated in Figure 1.4.

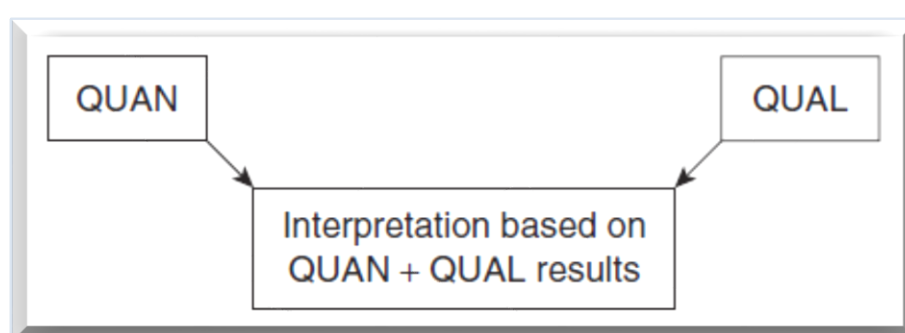


Figure 1.4: Concurrent triangulation mixed methods design

Adapted from Creswell and Plano Clark (2007: 73)

Figure 1.4 illustrates that both quantitative and qualitative data had equal emphasis in the study and were collected from the same participants. Then, the different results were converged (by comparing and contrasting the different results) during the interpretation in chapter 5 of this study. In order to have a clear picture of how the data was collected, below is the description of research methods and procedures that is, tools and techniques used in this study to gather and analyse data.

1.7.4 Research methods: procedures, data collection and tools

Fouché and Delport (2011:63) state that every research approach has its own purpose, methods of conducting the inquiry, strategies for collecting and analysing data and criteria for judging quality. This study is a mixed methods study; hence, the description of the population, sampling, data collection and analysis, trustworthiness and ethical consideration discussed in relation to the mixed methods approach and concurrent triangulation mixed methods design.

1.7.4.1 Population and sampling

Population, as defined by Welman, Kruger and Mitchell (2011:52), consists of individuals, groups, organisations, human products and events or the conditions to which they are exposed. Strydom (2011:223) shares this view and further describes population as subjects who possess specific characteristics or attributes in which the researcher is interested. Based on these definitions, I view the population as the larger pool from which sampling elements are drawn. In this study, the population from which I intended to obtain data consisted of teachers, specifically SBST members and LSEs.

It is a widely-held view that we usually cannot gather data from the entire population due to its size or accessibility or lack of resources. As a result, sampling must be used to save time and resources.

Sampling refers to the process to select a portion of the population for the study (Nieuwenhuis, 2011c:79). It can also be described as the process of selecting cases or units or elements that are included in a study to be used to collect data (Durrheim & Painter, 2010:133). Since this study employed a mixed-methods approach, it is apparent that its sampling procedure should be mixed-methods sampling.

Mixed-methods sampling designs utilise a time-orientation dimension as their base. The time-orientation refers to whether the qualitative and quantitative phases of the study occur at approximately the same point in time such that they are independent of one another (i.e., concurrent) or whether these two components occur one after the other such that the latter phase is dependent, to some degree, on the former phase (i.e., sequential) (Onwuegbuzie & Collins, 2007:290). This study employed a concurrent mixed-methods sampling approach which is explained in detail in chapter 3.

1.7.4.2 Data collection

Data for this study were collected in line with the paradigm (constructivism), the research approach (mixed methods) and the research design (concurrent triangulation). Therefore, as noted by Creswell (2008:34), a concurrent triangulation mixed-methods design is a type of design in which different but complementary data are collected during the same investigation. The data for this study were collected using questionnaires, a structured observation schedule, focus group interviews, learners' reading-screening test results and progress reports. These tools are described in detail in chapter 3 of this study. In summary, the process of collecting data in this study is outlined in Table 1.3.

Table 1.3: Data collection process

Type of data collected	Form of data collected	Data collection instrument	Participants
Quantitative data	Participants' experiences, perceptions, attitudes, beliefs and feelings towards the use of ICTs in supporting learners experiencing reading difficulties	Structured questionnaire	8 SBST members and LSEs per school The total number of participants is 50.
Quantitative data	Availability and the condition of ICTs and in the FSS	Structured observation checklist	No participants. I observed in the classrooms and the computer laboratories
Qualitative data	Participants' interpretation and description of the role of ICTs in supporting learners experiencing reading difficulties	Focus group interviews	SBST members LSEs
Qualitative data	Reading-screening reports, reading-progress reports and academic progress reports	Official documents (Reading-screening reports, reading-progress reports and academic progress reports)	No participants. I received learners' documents from the SBST coordinator

As shown in Table 1.3, data were collected concurrently using a structured questionnaire (which was completed by 50 participants, i.e., 40 SBST members and

10 LSEs); structured observation checklist for 5 FSS; focus group interviews (10 groups comprised of five participants each); and official documents (reading-screening reports, reading-progress reports and academic progress reports) for two groups of 24 learners per school. The first group was supported with ICTs and the second group was supported without ICTs. Data management and analysis were performed using quantitative and qualitative computer software as outlined below.

1.7.4.3 Data analysis

Prior to commencing the data analysis, qualitative data obtained from the interviews and observations were transcribed. Transcribed data were categorised and coded using the Atlas.ti computer software. For the quantitative data, the MS Excel package was used for the capturing of data which was then uploaded to the Statistical Package for the Social Science (SPSS) and Statistical Analysis Software (SAS) for analysis. According to Fouché and Bartley (2011:248), data preparation includes checking and editing collected data and eventually coding them into a format that is computer-readable; for example, converting raw data into numerical codes or numbers. The qualitative data were coded using words while the quantitative data were converted into statistical analysis.

Considering that this study was conducted using a triangulation mixed-methods design, a mixed analysis as recommended by Onwuegbuzie and Comb (2011: 3) was used. The mixed analysis involves the use of both quantitative and qualitative analytical techniques within the same framework, which represent analytical decisions that are taken both prior to the study and during the study. In addition, mixed analysis involves the following ways of analysing: (1) separately analysing quantitative data using quantitative methods and qualitative data using qualitative methods; and (2) analysing both data sets using techniques that 'mix' the quantitative and the qualitative data and results (Creswell, 2014:203).

As indicated above, two sets of data (quantitative and qualitative) were analysed separately. Statistical analysis of quantitative data was done using SPSS and SAS; qualitative analysis was done using Atlas.ti. The two sets of analysed data were merged using triangulation mixed methods. The detailed process of data analysis is outlined in detail in chapter 3 of this study. Criteria for judging the quality of this study are outlined below.

1.8 RELIABILITY, VALIDITY AND TRUSTWORTHINESS

It is a widely-held view of most researchers (such as Abowitz & Toole, 2010:108) that the mixed methods research improves the validity and reliability of the resulting data and strengthens causal inferences by providing the opportunity to observe data convergence or divergence in hypothesis testing. Because this study employed a mixed-methods approach, it was of utmost importance to consider issues of reliability, validity, and trustworthiness simultaneously (even though trustworthiness is more relevant to the qualitative part) in order to make sure that this study meets the quality requirements of good research. However, each one of these aspects is discussed individually below.

1.8.1 Reliability

Many scholars (such as Babbie, 2013; Lincoln & Guba, 1985) hold the view that one of the main requirements of any research process is the reliability of the data and findings. Zohrabi (2013:259) agrees that in the main, reliability deals with the consistency, dependability and replicability of “the results obtained from a research study”. He further points out that obtaining similar results in quantitative research is fairly straightforward because the data are in numerical form. However, in qualitative approaches to research, achieving identical results is quite demanding and difficult because the data are in narrative form and subjective. Reliability is also defined by Babbie (2013:188) as whether a particular technique, repeatedly applied to the same object, yields the same result each time.

In the same vein, Lincoln and Guba (1985:288) point out that instead of obtaining the same results, it is better to think about the dependability and consistency of the data. In this case, the purpose is not to attain the same results but rather to agree that, based on the data collection processes, the findings and results are consistent and dependable. For this study, reliability was enhanced due to the fact that data were collected from different sources (i.e., focus group interviews, a structured observation schedule and learners’ screening test results and progress reports). This is confirmed by several studies (Merriam, 1998; Lincoln & Guba, 1985) that reiterate that collecting varied types of information through different sources can enhance the reliability of the data and the results. In this way, the replication of the study can be carried out fairly easily.

1.8.2 Validity

Validity is described as a measure that accurately reflects the concept it is intended to measure (Babbie, 2013:191). Mainly, internal validity is concerned with the congruence of the research findings with the reality. Also, it deals with the degree to which the researcher observes and measures what is supposed to be measured. Zohrabi (2013:258) advises that to boost the validity of the research data and instruments, the researcher might apply the following six methods: triangulation, member checks, long-term observation at the research site, peer examination, participatory or collaborative modes of research and researcher's bias. This study, being a triangulation mixed-methods study, complies with Zohrabi's advice.

1.8.3 Trustworthiness

Trustworthiness is defined as the way in which the inquirer is able to persuade the audience that findings in the study are worth paying attention to and that the research is of good quality (Hinckley, 2011:299). Trustworthiness in this study was obtained through a process of testing the data analysis, findings and conclusions (Nieuwenhuis, 2011a:113). It also included participant or member checks, verifying and validating findings by providing copies of a draft report to the participants, controlling for bias, avoiding generalisation by seeking to understand from the participants' perspective, choosing quotes carefully, maintaining confidentiality and anonymity, and stating the limitations of the study up front.

1.9 ETHICAL CONSIDERATIONS

Ethical considerations are the most important part of research especially when it involves human subjects (Welman, Kruger & Mitchell, 2005:181). Strydom (2011:113) notes that they are pervasive and complex since data should not be obtained at the expense of human beings. He also indicates that human beings are objects of study that raise unique ethical problems. I agree with both authors and have, at all costs, avoided ethical lapses by adhering to the principles of informed consent, voluntary participation, and explicit confidentiality and anonymity agreements. As part of adhering to the ethical considerations, I applied for permission to conduct this study as follows:

- Application for permission to the GDE (because the study was conducted in the FSS in Gauteng), to conduct research.
- Application to University of South Africa (UNISA) Ethics Committee for ethical clearance.
- After obtaining the ethical clearance certificate and approval from the GDE, I sent letters to the principals of the identified FSS to gain permission to conduct the research in their schools. In the Principal's letter, there was also a request for distribution of parental consent that was required for obtaining the official documents of the learners experiencing reading difficulties.
- Before the interviews and observations, participants were given information sheets with informed consent forms attached, and they were requested to complete the informed consent forms after reading the information sheet. The information sheet provided the background to the study, aims and objectives and the limitations.

1.10 DELIMITATIONS

I considered FSS because they are the only schools in Gauteng Province of South Africa that have broadened their mission and vision to meet the needs of all their learners. They offer all services including health and safety to support the learners. They have resources including various assistive devices and ICTs. I did not include special schools or other ordinary schools because they are not fully resourced like FSS though they use the same methods of assessment to determine learner performance.

1.11 DEFINITION OF TERMS

1.11.1 Reading

Reading is defined as as understanding meaning of printed or written material and a means of language acquisition, communication, and sharing information and ideas (Reutzal and Cooter (2010:25). It is also viewed as an intensive process in which the eye quickly moves from left to right to assimilate text. However, Nel and Nel (2016:105) and Woolfolk (2007:502) define reading as a process of comprehending, interpreting, and guessing in which learners sample words and make predictions on text material, meaning that guesses are based on the context of other words in the passage.

Learners bring experience and their prior knowledge to the 'reading text', thereby extending comprehension beyond what is in the 'reading text'.

1.11.2 Full-service school

The term Full-Service School (FSS) means a school which serves as a central point of delivery, a single community hub for whatever education, health, social, human, or employment services have been determined locally to be needed to support a learner in school and in the community (Kronick, 2002:14). According to the Department of Education (2009:8), an FSS is first and foremost a mainstream education institution that provides quality education to all learners by catering for the full range of barriers to learning in an equitable manner.

1.11.3 Information communication technologies

ICTs is an umbrella term that includes any communication device or application, including radio, television, cellular phone, computer and network hardware and software, satellite systems as well as services and other applications associated with them such as video-conferencing. It refers to technologies that provide access to information through telecommunication (Rouse, 2008:15).

1.11.4 Reading difficulties

Reading difficulties are referred to as unexpected reading failure that cannot be accounted for by other disabilities. It is a generalised cognitive-linguistic weakness, or obvious environmental causes, including lack of appropriate instruction (Paratore & Dougherty, 2011:12). According to Woolfolk (2007:502), learners experiencing reading difficulties have difficulty understanding the link between letters and sounds and so cannot decode words or use phonics skills to sound them out.

1.11.5 Learning support educators

LSEs are qualified teachers with the relevant experience and expertise in the field of special needs, remedial education and IE background (DoE, 2004:3). According to the DoE (2001:47), the primary function of the LSEs is to evaluate and, through supporting teaching, build the capacity of schools to recognise and address severe learning difficulties and to accommodate a range of learning needs. At the GDE (where this study took place), LSEs are teachers employed at the District level but based at the

schools to provide support to the Institutional Level Support Team (ILST), and serve as a link between schools and the District office. They also ensure that learners with mild learning difficulties achieve maximum proficiency in literacy and numeracy before leaving primary school.

1.11.6 School-based support team

SBSTs are the structures within schools formed by teachers representing various committees (such as health and safety) and different grades. According to the DoE (2001:29), the SBST is the structure that supports the teaching and learning process by further identifying and addressing the learners', the teachers' and the institutions' needs.

1.11.7 Barriers to learning

Barriers to learning are obstacles or circumstances that stand in the way of a learner being able to learn effectively (Prinsloo, 2007:27). According to the DoE (2004:19), barriers to learning are anything that may prevent a learner from participating fully and learning effectively. Barriers to learning do not necessarily exist all the time, but can sometimes arise suddenly, due to circumstances or emotional. Nel, Nel and Hugo (2016:21-22) define barriers to learning as any factor that may cause breakdown in learning and state that barriers can be *extrinsic*⁶ or *intrinsic*⁷.

1.12 CHAPTER DIVISION

In Chapter 1, I gave a broad description of this study and established the significance of supporting learners experiencing reading difficulties using ICTs as a support mechanism. I also outlined the problem statement, research questions, hypothesis, aim of the study and how the study was carried out by means of research approach and design.

Chapter 2 is divided into two parts:

- Part 1: Literature review – Supporting learners experiencing reading difficulties

⁶ Extrinsic barriers are conditions outside of the 'learner' that can be caused by the society the learners live in or the school system, socio-economic issues such as poverty, abuse and lack of basic services (Nel, Nel & Hugo, 2016:21).

⁷ Intrinsic barriers are conditions within the 'learner' such as medical conditions and disabilities. Learners can be born with these conditions or they can be result of accidents or illnesses (Nel, Nel & Hugo, 2016:22).

In this part of chapter 2, I outline reading as a concept and explain the interrelationship between components and prerequisites of reading. The manifestation of reading difficulties is investigated to determine possible contributing factors, challenges, trends and the implications. The chapter also gives an overview of the support mechanisms used to support learners experiencing reading difficulties and illustrates the effectiveness of each.

- Part 2: Literature review – Theoretical framework

This part of the literature review delineates the three theories that form part of the theoretical framework that underpins this study (the sociocultural, Readers-response and e-Reading theories). The link between these three theories is illustrated in relation to the background and principles which pertain to supporting learners experiencing reading difficulties.

Chapter 3 outlines the research methodology of this study and provides a rationale for its suitability and relevance for the selected participants. It outlines the nature of the population, sample selection and methods of data collection that were used in the study. The researcher also describes ethical considerations, reliability, validity and trustworthiness in this chapter.

In chapter 4, the findings from the data collected qualitatively from interviews, observations and quantitatively from questionnaires and reading tests results are analysed and presented. The analysis was done in accordance with the research methodology described in chapters 1 and 3.

Chapter 5 is the final chapter of this study. In this chapter, the study is summarised in terms of how the research questions were answered. Finally, conclusions and recommendations on the findings and guidelines for using ICTs to supporting learners experiencing reading are presented.

1.13 CONCLUSION

Reading difficulties have been a constant challenge in the education system, despite various interventions, strategies and campaigns employed. However, a study by van Wyk and Louw (2008:245) highlights the success of the use of a Technology Assisted Reading Programme. Although this was the case, technologies other than computers that formed part of the ICTs as support mechanisms do not appear to have received

much attention, and I was thus motivated to consider other forms of ICTs. ICTs have the potential to provide socially-rich environments in which learners can explore knowledge domains by communicating with their fellow learners, teachers and outside experts. It is my view that ICTs are mediating agents in today's environment, and, for the purpose of this study, ICTs can be used as support mechanisms since they are able to influence how we live our lives including how we communicate. They can also support the learning process, including learning how to read.

CHAPTER 2: LITERATURE REVIEW

“Reading is the fundamental method of social progress and reform”.

(Dewey, 1897:77)

2.1 INTRODUCTION

In Chapter 1, I emphasised the significance of supporting learners experiencing reading difficulties using ICTs as a support mechanism. It was also noted in chapter 1, that the primary objective of this study is to explore, describe and explain the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties ultimately to improve their levels of academic achievement in the FSS. The general aims and objectives were also presented in Section 1.6 in support of and in order to sustain the aim.

Reading difficulties are increasingly recognised as a serious, worldwide concern about academic performance. This is justified by several studies such as the Association for the Development of Education in Africa⁸ (2017) and UNESCO (2015) which produced estimates of learners who dropped out of school due to their barriers to learn to read without mastering this basic skill. These statements are in line with the main aim of this study.

The term ‘reading difficulties’ is, in most instances, used synonymously with ‘reading problems’, and in the context of this study, the term ‘reading difficulties’ was used. This chapter is structured in two sections: The first section begins by describing reading and explains how reading difficulties manifest. The remaining part of the first section explores the challenges, trends and the implications of reading difficulties, especially in the FSS. Reasons for focusing on the FSS are outlined in chapter 1 of this study (Section 1.1 and 1.2.4). In the second section (2.9) of chapter 2 (theoretical frameworks), the theoretical framework that underpins this study is discussed. There are three main theories that form part of the theoretical framework for this study namely: sociocultural theory, Readers-response theory and e-Reading theory.

⁸ Association for the Development of Education in Africa (ADEA) is a forum for policy dialogue, composed of all the 54 Ministers of Education in Africa and 16 development partners. It was established in 1988 initially as a framework for better coordination among development agencies

The focus of this study is on addressing reading difficulties using ICTs as a support mechanism. However, it is of utmost importance to first unpack what reading entails before defining reading difficulties and outlining how they manifest.

2.2 WHAT IS READING?

Several definitions of reading are presented in this chapter. The concept reading originates from the concept 'read', which carries diverse meanings. Reading is defined by Merriam-Webster.com (2016) as follows: as a transitive verb, among others, reading means: (1) to receive or take in the sense of (as letters or symbols) especially by sight or touch; (2) to study the movements of (as lips) with mental formulation of the communication expressed; (3) to learn from what one has seen or found in writing or printing; or (4) to utter interpretively. As an intransitive verb, it implies to perform the act of reading words, read something, to learn something by reading, and to pursue a course of study. A study conducted by Winch, Johnston, March, Ljungdahl and Holliday (2015:3-24) reveals that reading is a compound process of literate thinking where the meaning derived by individual readers is dependent on the contexts in which they read. In addition, Harris, Davidson and Aprile (2015:627) suggest that learners read not only to learn, but to participate in communities of readers in school and everyday life, and for enjoyment. From these definitions, it can be concluded that reading is a means of exposing learners to new information and insights, and subsequently empowers them to engage in academic activities.

Recent developments in reading as a process have heightened the need for considering the aspects, areas or components of reading development. For the purpose of this study, the term components of reading development are used. Nel and Nel (2016:105) refer to the components of reading as the things that must be mastered to become an adequate reader. Similarly, Dally, Neugebauer, Chafouleas and Skinner (2015:57) and Dednam (2011a:144) recognise components of reading development as foundational reading skills that support reading but receive different instructional emphases across the school grades or on curricular benchmarks. The components of reading development described below are not cast in stone. However, for the purpose of this study, only phonemic awareness, phonics, fluency, vocabulary and comprehension were considered and described because they serve as the foundation for the development of reading skills and are used as the common targets for

assessment and instruction during the teaching and learning processes (Dally et al., 2011:55).

2.2.1 Components of reading development

2.2.1.1 Phonemic awareness

Phonemic awareness, according to Dednam (2011a:144) and Woolfolk (2016:166) is the ability to manipulate individual sounds in spoken words. In addition, Lipson and Wixon (2013:318) alert that the learners in the society are surrounded by print – on doors, food packages, television and clothing. They advised that before learners learn to read print, they need to become aware of how the sounds in words work. They must understand that words are made up of speech sounds or phonemes. Phonemes are the smallest parts of sound in a spoken word that makes a difference in the meaning of the word (Lipson & Wixon, 2013:311). Nel and Nel (2016:106) put the necessity of phonemic awareness in reading forward by indicating that it helps learners with comprehension and spelling.

2.2.1.2 Phonics

Phonics is described by Scanlon, Anderson and Sweeney (2010:77) as the system by which the sounds in the spoken language are represented by the letters (or other symbols) in the printed language. On the other hand, Nel and Nel (2013:107) view phonics as the relationships between the letters (graphemes) of written language and the individual sounds (phonemes) of spoken language. A broader perspective has been adopted by Liu (2010:1-5) that when learners are exposed to phonics, they learn to use these relationships to read and write words. He further explains that the goal of phonics instruction is to help learners learn and use the alphabetic principle – the understanding that there are systematic and predictable relationships between written letters and spoken sounds. Gunning (2010: 218) warns that failure to master phonics and other related word-analysis skills leads to reading difficulties.

2.2.1.3 Fluency

Fluency is the ability to read a text accurately and quickly. Thus it is important that when fluent readers read silently, they recognise words automatically (Dally et al., 2015:11). It should be noted that learners who read with fluency group words quickly to help them gain meaning from what they read and they read aloud effortlessly and

with expression. Their reading sounds natural, as if they are speaking (Lipson & Wixon, 2013:37). However, Gunning (2010:286) argues that before learners can read fluently, they must first achieve accuracy. Sharing the same sentiments as Gunning, are Denton, Vaughn, Wexler, Bryan and Reed (2012:18) who state that learners who have not yet developed fluency read slowly, word by word. Their oral reading is choppy and plodding.

The importance of fluency in reading which is theorised by Pikulski and Chard (2005:1) as the bridge between word recognition and comprehension. In the same vein, Nel and Nel (2016:110) note that fluency increases comprehension; however, they caution that fluency-building strategies are not the same as comprehension-building strategies.

2.2.1.4 Vocabulary

According to Dednam (2011a:146), vocabulary refers to the words a person understands (i.e., meaning vocabulary) and the words a person actually uses (i.e., utility vocabulary). Hanson and Padua (2014:5) refer to “receptive vocabulary” which they describe as the words we understand through reading and listening and “productive vocabulary” which are the words we use to communicate through verbal conversations. In describing vocabulary in general, Hanson and Padua (2014:5) point out that it is the words we must know to communicate effectively. Vocabulary can thus be described as oral vocabulary or reading vocabulary. Oral vocabulary refers to words that we use for speaking or recognise in listening. Reading vocabulary refers to words we recognise or use in print (Armbruster, 2010:29). In addition, Nel and Nel (2016:111) draw our attention to the fact that learners have listening, speaking, reading and writing vocabulary.

In view of all that has been mentioned so far, one may suppose that vocabulary is very important to reading comprehension. Lipson and Wixon (2013:472) emphasise that vocabulary has a strong impact on comprehension which means that learners cannot understand what they are reading without knowing what most of the words mean. Amirian, Zareian and Nour (2016:604) agree that vocabulary is an essential component of language proficiency, which provides the basis for learners' performance in other skills.

2.2.1.5 Comprehension

Comprehension according to Scanlon, et al. (2010:276) is an active, constructive process in which the ultimate understanding of a text is determined by a combination of what is stated directly in the text and the learner's pre-existing knowledge related to the text. Furthermore, Kamhi and Catts (2017:104) argue that reading comprehension is not a single ability because it varies as a function of the interaction among learner, text and task factors.

From the definitions above, one can conclude that comprehension is the reason for reading. If learners can read the words but do not understand what they are reading, they are not really reading. Nel and Nel (2016:112) point out that reading might not be successful for learning if there is no comprehension.

Other significant aspects of reading are the different stages that are involved in comprehension as a process which is signified by several recent studies (Gillet, Temple, Temple & Crawford, 2012; Tompkins, 2010) that have shown that reading as a process evolves through a number of stages. I chose to discuss the reading stages outlined by Gillet et al. (2012:12). Although they are not cast in stone, they serve as a guide so that the discussion of reading difficulties which follows in the section below is properly linked with the relevant stages.

2.2.2 Reading stages

Wolf (2008:1) explains that reading is not something that just happens. She further argues that one does not wake up literate nor does one become literate in the same way that one learns to walk. In her argument, Wolf stresses that reading is not intuited from the environment, nor is it simply a matter of physical maturation. She advises that learning how to read requires instruction and practice, and this learning occurs across discrete stages. In Figure 2.1, the stages of learning to read are depicted.

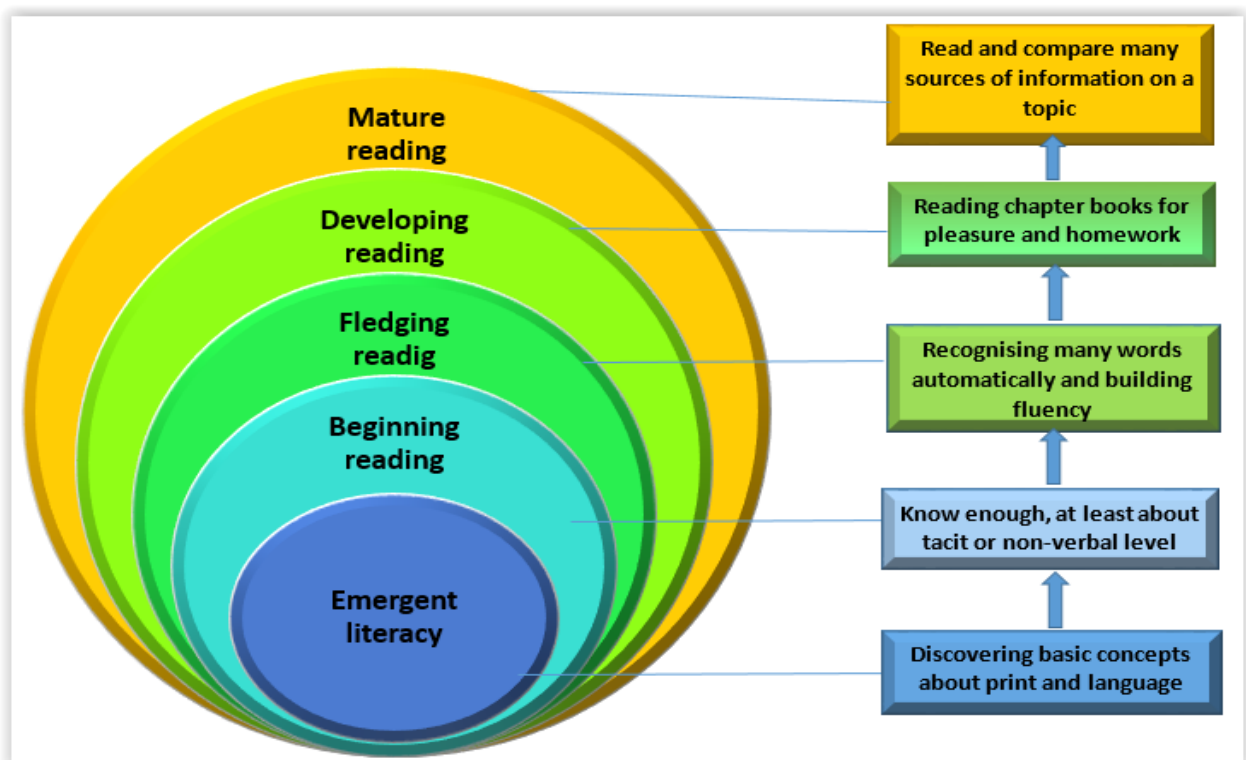


Figure 2.1: Reading stages

Adapted from Gillet et al. (2012:12)

The descriptions of the reading stages are as follows:

2.2.2.1 Emergent literacy

The concept of emergent literacy is traced to a number of researchers such as Clay (2006), Ferreiro and Teberosky (1982) and Teale and Sulzby (1989) cited in Gillet et al. (2012:12) where it was once called reading readiness or pre-reading. Similarly, Gunning (2013:124) states that emergent reading is the initial stage of reading where learners learn to spell in an informal manner. The learner who is at emergent literacy stage, according to Vogler-Elias (2013:1078), often uses pictures to confirm predictions or develop the ability to focus attention on letter-sound relationships.

As shown in Figure 2.1, emergent literacy is illustrated as the initial stage of reading where learners discover concepts about print and language. For example, emerging reading arises out of years of perception, increasing conceptual and social development, and cumulative exposure to oral and written language (Wolf, 2008:115). That means for the learner to succeed at this level, an adult has to read dialogically, respond to the learner's questions, and appreciate the learner's interest in books and

reading. By the end of this stage, the learner pretends to read, can – over time – retell a story when looking at pages of a book previously read to him/her, can name letters of alphabet; can recognise some signs; can print own name; and plays with books, pencils and paper (Justice, 2006:3).

2.2.2.2 Beginning reading

Beginning to read according to Gillet et al. (2012:12) is the stage where learners begin to read and when they learn to recognise words appearing in different contexts. For example, in this stage, the learner is learning the relationships between letters and sounds and between printed and spoken words. They start to read simple text containing high-frequency words and phonically regular words and use emerging skills and insights to sound out new one-syllable words. As signified by Wolf (2008:116), reading begins with learning to decode print and to understand the meaning of what has been decoded. She further advises that for the learner to get there, he/she must figure out the alphabetic principle that took our ancestors thousands of years to discover. In addition, Gillet et al. (2012:13) further claim that this stage marks the beginning of true reading; however, it comes only after prior learning.

2.2.2.3 Fledgling reading

Learners in the fledgeling stage have moved beyond the highly predictable books that the beginners enjoy (Gillet et al., 2012:14). This view is supported by Tyner and Green (2012:4) who refer to the fledgeling stage as the stage of recognising and using word families in reading and writing; recognising 100+ sight words; reading more complex texts; developing fluency; developing comprehension strategies and self-correcting errors. Fair and Combs (2011:225) assert that during fledgeling reading, learners start to improve their decoding skills. Consequently, they need opportunities to practise more rapid and fluent, independent, silent reading using increasingly complex materials. When learners begin to master the increasingly complex materials, they may struggle to read the words which they seldom use or have not previously encountered.

It can be concluded that this is a stage where the learners' reading difficulties are identifiable. This stage, therefore, provides important insights into the point of becoming fluent, which can be described as really reading and understanding. It can

also be seen from Figure 2.1 that it is the stage where a learner recognises many words automatically and builds fluency.

2.2.2.4 Developing reading

During the developing stage, most learners begin to use reading as their vehicle for learning. By drawing on the schema theory of comprehension, Gillet et al. (2012:15) were able to show that, at this stage, learners are able to read for meaning and are able to bring personal experience to the text. Similarly, Wolf (2008:136) puts forward that, by this stage, a learner reads to learn new ideas in order to gain new knowledge, to experience new feelings, to learn new attitudes, and to explore issues from one or more perspectives.

Against this background, it is probable therefore that learners experiencing reading difficulties might as well be identifiable especially when it comes to knowing how to activate prior knowledge before, during and after reading, to decide what is important in a text, to synthesise information, to draw inferences during and, after reading, to ask questions, and to self-monitor and repair faulty comprehension. From Figure 2.1, it is evident that at this stage, a learner should be able to read for pleasure and be able to do homework.

2.2.2.5 Mature reading

Mature reading is the last developmental stage of learning how to read as illustrated in Figure 2.1. Wolf (2008:145) refers to this stage as the expert reader stage because that is when learners can read anything they choose to read. As illustrated in Figure 2.1, learners at the mature stage can read and compare many sources of information on a topic. Drawing from Wolf's examples of this stage, it is apparent that when learners at the mature reading stage look at a word, the first three cognitive operations are: (1) to disengage from whatever else one is doing; (2) to move our attention to the new focus (pulling ourselves to the text); and (3) to spotlight the new letter and word.

At the mature reading stage, the learner begins to develop word knowledge, phonemic awareness, and syntax; these processes start to become automatic. Furthermore, at this stage, learners can quickly and unconsciously recognise meanings of words, chunk groups of words into meaningful phrases, and easily [hear] the rhythm and intonation in the text and read faster. They are becoming fluent readers (Fair & Combs,

2011:225). Nevertheless, Gillet et al. (2012:16) caution that learners who did not reach this stage adequately tend to have difficulty completing literacy tasks. For example, a learner must expend considerable mental effort pronouncing and decoding words, then putting strings of words into meaningful phrases until the learner can move with automaticity through the vocabulary and structure of the text (Fair & Combs, 2011:225).

As learners develop and move into new stages of reading (emerging, beginning, fledgeling, developing, and maturing), they are likely to show temporary setbacks as they tackle more complex reading tasks (Ganske, 2014:420). With a similar view, Janse van Rensburg (2015:1-23) notes that learners are not ready to move to the next stage if they cannot make use of a baseline in their current reading stage. Drawing from Piaget's theory of cognitive development, it is worth noting that a learner should, therefore, have reached a certain level of mastery in the current stage to be able to move to the next stage and eventually be a successful reader (Fischer, 1980:477).

In the light of all the descriptions of the reading stages above, it is evident that, from the first stage a learner is developing into the next level of reading. It is also noticeable that if the learner fails to acquire the first stage, it might be difficult to acquire the second one and even more difficult to acquire the rest of the reading stages. That being the case, I conclude that if the teacher is aware of the different reading stages, it would be easy to identify the learners who are experiencing reading difficulties. Drawing from the recent literature, it is clear that the teacher must be aware of the learning intentions, know when a learner is successful in attaining those intentions, have sufficient understanding of the learners' prior understanding as they come to the task, and know enough about the content to provide meaningful and challenging experiences so that there is progressive development (Hattie, 2012:19)

Subsequently, support for the learners experiencing reading difficulties needs to be more explicit and comprehensive and more intensive, than the support required by most learners (Foorman & Torgesen, 2001:206). However, it should be acknowledged that a suitable support mechanism for one learner may not be suitable for another. For example, embedded phonemic awareness in rich, guided reading may be effective for a learner at the beginning reading stage with moderate to high literacy skills entering

school; but low literate learners require additional, intensive and systematic focus on decoding skills to make comparable gains.

On a positive note, data from studies on reading (Chall, Jacobs & Baldwin, 1990:66; Daly et al., 2015:13) suggest that learners are able to accomplish the stages of reading with ease if they have acquired the prerequisites for reading. In addition, recent developments in the field of reading have led to a renewed interest in the prerequisites for reading, because of the strong impact they have on the effectiveness of support mechanisms.

2.2.3 PREREQUISITES FOR READING

Prerequisites for reading are defined as skills that are the necessary basis for learners to learn to manipulate letters, words, and symbols and begin to see some form of equivalence between words and sentences and their own mental content (Fontenot, 1974:1). From this definition, I presume that a learner who has acquired the prerequisites for reading can respond positively towards the reading-support mechanism. Figure 2.2 on the next page illustrates the prerequisites for reading.

The prerequisites for reading as illustrated by Figure 2.2 include phonological awareness, phonemic awareness, vocabulary development, alphabetic principles and print knowledge. It should, however, be noted that phonemic awareness and vocabulary development serve as both components of and prerequisites for reading. As Figure 2.2 shows, there is an interrelationship between phonemic awareness and phonological awareness. However, Messier and Jackson (2014:522) explain that phonological awareness is much broader than phonemic awareness. They also state that phonological awareness includes other skills such as syllabic knowledge, onset, and rhyme.

Over the past decade, much research such as Snow, Burns and Griffin (1998: 41) has emphasised phonological awareness as a strong predictor of later reading achievement. This is consistent with the work of Lipson and Wixon (2013:51), which shows that both phonemic and phonological awareness are prerequisite skills for the development of the alphabetical principle.

In contrast, Daly et al. (2015:67) concludes that although phonological awareness is a good predictor of reading success, there are mixed results on the impact of direct

instruction of phonological awareness on literacy skill development after the learner enters the first grade.

As indicated above phonemic awareness and phonological awareness are interrelated, and, according to Nel and Nel (2016:106), it is the specific understanding that spoken words are comprised of sequenced phonemes blended together. For example, this is evident when separating the spoken word cat into three distinct phonemes (/k/, /æ/, and /t/).

Activities that can improve phonological awareness and phonemic awareness, according to Gunning (2013:182), are rhyme, segmentation of morphemes and syllables, categorisation and identification of syllables, and identification of similar and different sounds in word pairs. He further suggests that teachers should read a variety of stories and other written material to and with the learner.

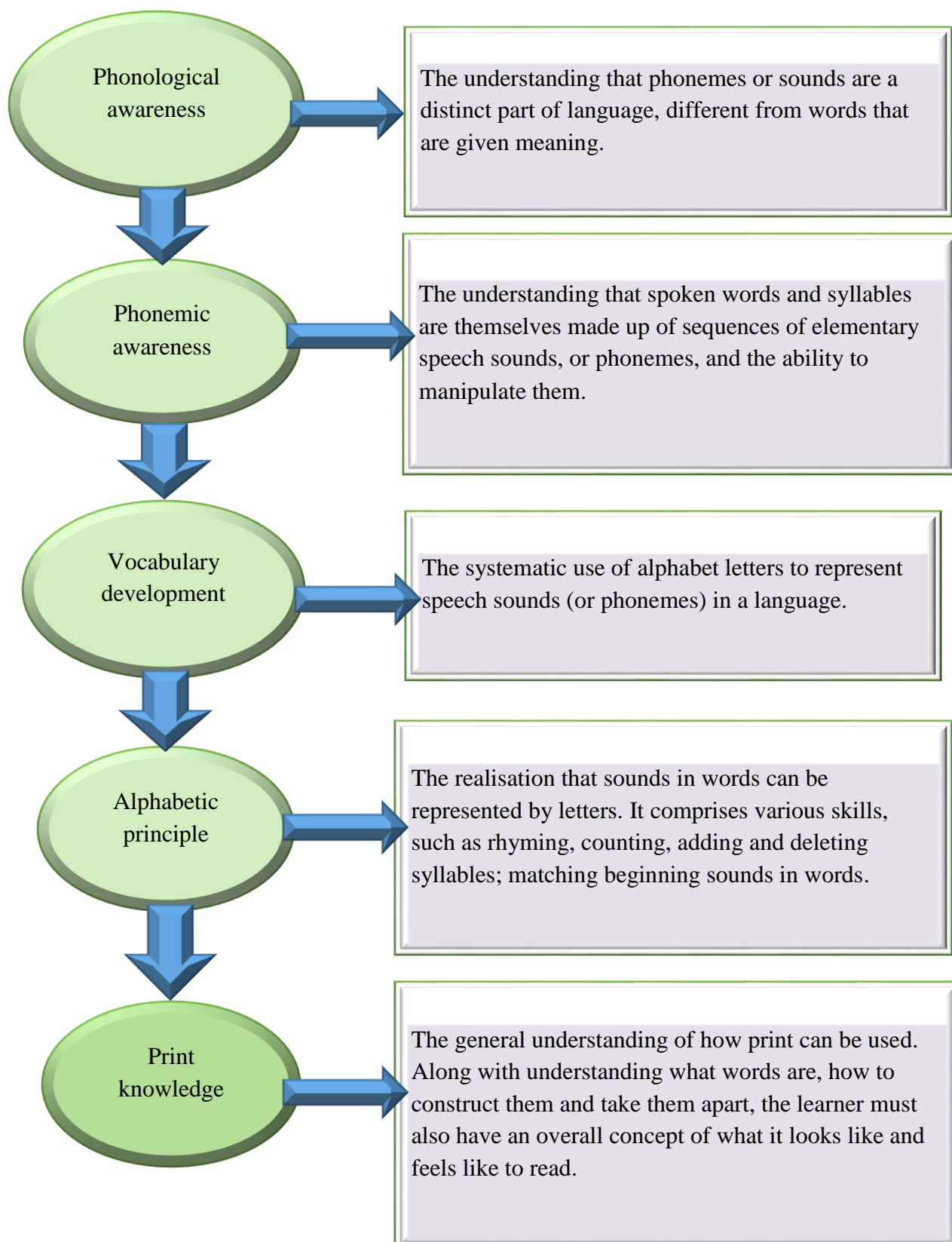


Figure 2.2: Prerequisites for reading

Adapted from Daly et al. (2015:59)

It is apparent from Figure 2.2 that the relationship between vocabulary development and reading extends beyond its significant impact on comprehension. Lipson and Wixon (2013:31) maintain that the correlation between vocabulary size and literacy is well-documented, particularly for early reading ability. There is a consensus among social scientists that socio-economic status may be correlated with vocabulary size because these studies proved that learners in professional homes heard 382 words an hour while learners raised in welfare homes heard an average of 167 words an hour.

Similarly, one study conducted by Hart and Risley in 1995, cited in Lipson and Wixon, (2013:31) demonstrated that first graders from higher-income families had almost double the vocabulary than those from lower income families. In their study, a typical learner in a household receiving welfare heard just 616 words per hour, less than half the number heard by a learner in a working-class home which amounts to 1,251 words per hour. Another study by Dobbs-Oates, Pentimonti, Justice and Kaderavek (2015:91) revealed that parents' negative beliefs about reading appear to be key predictors of learners' print knowledge.

However, interestingly, this is contrary to a study conducted by Raphael (2000:3) who found that regardless of the learner's background and learning experiences, his or her vocabulary can be increased through repetitive exposure to new words and rich conceptual experiences. Print knowledge as the last prerequisite, illustrated in Figure 2.2, indicates that a learner should be able to contrast words and make meaning out of them.

Print knowledge, according to Lipson and Wixon (2013:318), includes but is not necessarily limited to, understanding the direction in which words are read, or proper orientation of reading materials (holding the book right side up, moving from the left page to right page, and reading sentences from left to right). Summing up their investigation on print knowledge, Lipson and Wixon (2013:319) point out that many print knowledge skills are acquired through witnessing a behaviour, such as observing parents reading for pleasure or necessity, using writing in a variety of settings, reading to the learner, or dictating what the learner says.

The reading stages and prerequisites for reading would help the teachers and anybody who is supposed to support the learner experiencing reading difficulties to administer

the relevant support mechanism. However, researchers such as Gunning, (2013:25), Gillet et al. (2012:12) and Jennings, Schudt, Caldwell and Lerner (2010:71) argue that proper identification can only be made through a careful and proper screening which should also indicate the possible cause that might be contributing to the reading difficulty.

Several studies report that, despite the increased use of support mechanisms, screening/assessment for most learners experiencing reading difficulties is still recommended to measure the level of the difficulty. As indicated above, with the identification of the level of reading difficulties and possible contributing causes, it is vital to identify the entry point of the support required (Lipson & Wixon, 2013:65). There are several screening tools/assessment tests that can be used for the identification. For the purpose of this study, the terms that is used are screening tool and identification instead of 'diagnosis' which is a medical model and completely rejected by the IE approach.

The reading stages and prerequisites for reading discussed above, are key components of effective reading ability (Chall et al., 1990:87). That being the case, learners should have the opportunity to consolidate their current reading skills and knowledge (that they are expected to complete independently at their current stage) while experiencing more advanced reading skills and knowledge (that they can complete through the assistance/scaffolding/modelling of experienced adults). Snow (2006:282) draws our attention to the fact that, too often, a learner will stagnate at one level without getting the instructional momentum, opportunities, and experiences necessary for further stages of development. However, this does not necessarily mean that the learner is experiencing reading difficulties.

Having that in mind, Akyol, Çakiroğlu and Kuruyer (2014:200-204) who regard reading as a complex cognitive process, warn that it cannot always be achieved by all the learners effectively and successfully. This is signified by recent studies such as the National Reading Panel⁹ (NRP) and Global Reading Network¹⁰ which corroborate that many learners across the globe are experiencing reading difficulties, despite the

⁹ National Reading Panel (NRP) was a United States government body. Formed in 1997 at the request of Congress, it was a national panel with the stated aim of assessing the effectiveness of different approaches used to teach children to read.

¹⁰ The Global Reading Network is governed by an interagency, inter-organisational Steering Committee made up of members from bilateral and multilateral development organisations and donors, international and national NGOs, Ministries of Health, academics, and others concerned and committed to All Children Reading.

apparent importance of reading and significant efforts of teachers and other stakeholders in making sure that all learners acquire reading skills.

2.3 READING DIFFICULTIES

The concept 'reading difficulties' as one of the barriers to learning is broadly perceived and very fluid in nature. To validate this statement, some authors identify it as reading difficulties while some refer to it as reading disabilities. While a variety of terms have been suggested, this study uses the term reading difficulties. According to Scanlon (2010:13), reading difficulties may be described as a lack of phonological processing skill; the inability to attend to the individual sounds in the spoken words; or the inability to use the relationships between letters and their sounds to figure out the pronunciation of printed words. In addition, reading difficulties are viewed as a lack of basic reading skills that involve the prerequisites for reading required to understand the relationship between letters, sounds and the words they represent (Mphahlele, 2013:32).

For the purpose of this study, reading difficulties are considered as the inadequate ability of a learner to identify basic sight words, difficulty with word-analysis skills and decoding, inadequate vocabulary development and lack of comprehension skills. The impact of reading difficulties among others are prejudice, stigmatisation, humiliation and pressure as learners often find the teaching and learning materials beyond their scope of comprehension (Shandu, 2008:11). The effects of reading difficulties can be associated with different types of reading difficulties. Table 2.1 illustrates different types of reading difficulties, their possible causes and suggested support mechanisms.

Table 2.1 illustrates types of reading difficulties, some of their possible causes and some of the support mechanisms that can be employed to address the types of reading difficulties. A relatively large number of studies have now identified factors associated with reading difficulties and advise that among these factors, there are those that qualify learners for special education services as recommended by the Individuals with Disabilities Education Act (IDEA). According to Gillet, Temple, Temple and Crawford (2012:457) within IDEA legislation, there are provisions that mandate serving learners who are experiencing reading difficulties with appropriate support programmes in a less-restrictive environment. That being the case, Gillet et al. (2012:427) advise that

identification of possible contributing factors is vital for proper support to be administered.

Table 2.1: High-frequency types of reading difficulties

Type of reading difficulties	Possible causes	Suggested support mechanism
Does not recognise the letters or words accurately (poor phonics skills)	<ul style="list-style-type: none"> - Hearing difficulties - Delayed auditory development 	<ul style="list-style-type: none"> - Referral to ear, nose and throat specialist - Elicit rhyming words
Misreads or reverses individual letters b/d, p/q	<ul style="list-style-type: none"> - May not have developed visual memory for individual letters - Visual-spatial orientation - Difficulties with directionality 	<ul style="list-style-type: none"> - Use individual letters to make up words that have not been correctly read
Poor comprehension	<ul style="list-style-type: none"> - Poor reading fluency - Poor decoding skills - Poor reading prosody - Poor language processing - Limited vocabulary - Poor memory 	<ul style="list-style-type: none"> - Neurological impress method - Audiotapes - Assisted reading - Repeated reading - Dyad reading
Slow processing (speed)	<ul style="list-style-type: none"> - Anxiety - Attention Deficit Hyperactivity Disorder (ADHD) 	<ul style="list-style-type: none"> - Work on planning and organisational skills - Consider ADHD medication
Difficulty pronouncing words	<ul style="list-style-type: none"> - Mixing up short and long vowel sounds - Misunderstanding of voiced and unvoiced sounds. 	<ul style="list-style-type: none"> - Teach one phoneme at a time. - Explain Magic-E rule. - Use visuals. - Encourage the use of dictionary and games. - Use TV shows, songs and movies.
Limited vocabulary	<ul style="list-style-type: none"> - Inability to use contextual clues - Complexity of word knowledge - Inability to differentiate between spoken English and written, or literate English 	<ul style="list-style-type: none"> - Mnemonic strategies - Incidental reading - Let learners start own dictionaries.
Poor spelling	<ul style="list-style-type: none"> - Poor visual memory - Dyslexia - ADHD - Language processing problems 	<ul style="list-style-type: none"> - Provide systematic phonics instruction that incorporates teaching of phonemic awareness - Encourage independent reading

Adapted from Moonsamy and Durbach (2016:216)

2.3.1 Possible contributing causes of reading difficulties

As indicated above, reading is a complex process affected by various learners' abilities and capabilities. Identification of the impact of the possible contributory and causal factors assist with the selection of a relevant support mechanism. Gillet et al. (2012:428) identify factors that can be secondary or contributory causes of reading difficulties namely: intellectual, physical, language and learning factors. They consider these factors peripheral to reading but caution that they can affect the entire enterprise of learning. The contribution of each of these factors to reading difficulties is discussed below.

2.3.1.1 Intellectual factors

Intellectual factors are intrinsic barriers to learning because it is within the learner. Intellectual factors that affect reading include, but are not limited to, oral reading, reading comprehension, word recognition skills, and reading habits. Intellectual and developmental learning disabilities are often seen in learners while learning how to read, and symptoms progressively get worse without appropriate resources (Sanford, 2015:93). For instance, using descriptive words helps learners form mental representations or teaching learners to re-read, paraphrase, and summarises what they have read in their own words. Reading difficulties are mostly identified using an intelligence test. According to Gillet et al. (2012:436), the intelligence tests tend to show contradictory findings: that good readers tend to perform better on IQ tests than poor readers, and that reading difficulties are not limited to learners with lower IQs but are found across the whole range of intellectual abilities.

2.3.1.2 Perceptual factors

Perceptual factors were studied by Thurstone (1938) using a battery of 56 tests to determine whether the same seven primary schools would be found in a different population of subjects and with another battery of tests. The plausible description formulated from the study is that the perceptual factor can be identified by saturation in verbal classification, word grouping, disarranged sentences, identical forms, and picture recall (Thurstone, 1938:12). A simplified definition for perceptual factors is that

they are skills that enable one to give meaning to data perceived through one's senses (Dednam, 2011c:219).

In the same vein, Hugo (2016:163) defines perceptual factors as the ability to become aware of information or of something through the five senses: hearing, seeing, touching, smelling and taste. She further identifies perceptual difficulties related to auditory (difficulty interpreting heard sounds), visual (difficulty to gain the correct meaning of picture) and motor perceptual (difficulty to relate predominantly to the orientation of the body) problems.

Drawing from Table 2.1, it is evident that auditory and visual perceptual difficulties are possible causes of poor phonics and poor word recognition. Consequently, it is worth focusing on these perceptual difficulties individually. Dednam (2011c:220) describes visual perceptual difficulties as a lack of spatial orientation and determination of direction while Hugo (2016:163) explains it as the ability to interpret sensory data that is received through the eyes. As illustrated in Table 2.1, learners with visual perceptual difficulties may experience problems with spelling as one of the types of reading difficulties. The other implications of visual perceptual difficulties are noted by Zhou, McBride-Chang and Wong (2014:1) as difficulty in differentiating between visually similar letters or words. For example, distinguishing b from d, a from e, or book from boot because all require visual differentiation.

Auditory perception is explained as the ability to interpret sensory data that is received through the ears. A learner with auditory perceptual difficulties can hear the sounds but has a problem interpreting them (Hugo, 2016:163). Studies conducted by Mack and Thomas (2010) and Ouimet and Balaban (2009) suggest that auditory perceptual difficulties adversely affect one's ability to detect and process speech patterns, resulting in impaired phonological representations, specifically required for speech perception. Unclear phonological representations are likely to lead to impaired phonological awareness which in turn may result in the development of reading difficulties.

2.3.1.3 Language factors

A considerable amount of literature has been published on language development. These studies indicate that most learners use echolalia (a parrot-like repetition) to learn language. They copy sounds and words, and eventually phrases and sentences

that they hear adults use in specific repetitive context. At the age of six, when learners enter foundation school phase, most of them are ready and able to start learning to read at a formal level (Dednam, 2011b:126). It is, therefore, safe to conclude that learners' reading ability develops after they have mastered a certain level of spoken language.

In addition, Friend and Bursuck (2010:244) brought to light that learners who have language problems have trouble with either or both of two key parts of language: receptive language and expressive language. Receptive language involves understanding what people mean when they speak to you. Expressive language concerns speaking in such a way that others understand you. They further explain that learners with expressive language problems are unable to communicate clearly, and their spoken language may include incorrect grammar, a limited use of vocabulary, and frequent hesitations.

Drawing on an extensive range of sources, Gillet, et al. (2012:443) set out the different ways in which language can contribute towards impeding reading ability such as learners having difficulty retrieving words and as a result, they may struggle to recall names of objects or describing words. Referring to Table 2.1, it is apparent that these learners may experience spelling problems. Cockrum and Shanker (2013:279) provide an in-depth analysis of the contribution of language problems in causing reading difficulties by arguing that the learner with language problems may present with the following combination of reading difficulties: decoding phonics, structural analysis¹¹ and fluency skills.

2.3.1.4 Learning factors

In recent decades, learning factors such as dyslexia have been the subject of major research studies aiming at defining the terms, identifying learners with these problems, and discovering appropriate support mechanisms. Dyslexia is defined by Gillet et al. (2012:443) as a medical term for a profound inability to read or to learn to read. One of the first definitions was proposed by Orton (1937:48) who described learners with dyslexia as being delayed in reading compared to their peers, as they tend to reverse letters or words, and often being able to read only by holding the print up to a mirror.

¹¹ Structural analysis is often referred to as morphology, is concerned with the study of meaning-bearing units such as root words, prefixes, suffixes, possessives, plurals, and syllables (Cockrum & Shanker, 2013:133)

Stanovich (1986:375) explains that readers with dyslexia made no more reversal errors than did learners experiencing reading difficulties at their same level of reading development. Stanovich's finding is consistent with findings of past studies by Liberman, Shankweiler, Fischer and Carter (1974:201) who found that learners with dyslexia were far more likely to have trouble processing sounds in words which affects their ability to read with fluency.

It has been conclusively proven that reading difficulties occur on a continuum, given the possible contributing causes of reading difficulties above. Drummond (2014:4) states that learners experiencing reading difficulties require targeted reading assistance.

2.4 CHALLENGES, TRENDS AND THE IMPLICATIONS OF READING DIFFICULTIES GLOBALLY, IN SUB-SAHARAN AFRICA AND LOCALLY

It was noted from chapter 1 (Section 1.2.1-1.2.3) that reading difficulties are common and are associated with poor academic achievement. According to Hakkarainen, Holopainen and Savolainen (2013:488), learners experiencing reading difficulties are at risk of dropping out of school and are often inadequately prepared for the academic challenges they face during their education. Similarly, Hamilton and Glascoe (2006:80) found that at least one in five learners have significant difficulty learning to read. Their evidence clearly demonstrates that most learners experiencing reading difficulties fail to catch up with their peers. Although most of these learners eventually become literate, many continue to have reading difficulties and never become fluent readers (Torgesen & Hudson, 2006:133).

Reading difficulties create challenges for learners such as underperformance, poor self-esteem and learner dropout. Forbes (2017:445) who states that it is embarrassing and devastating for a learner to read with difficulty in front of peers and teachers and to demonstrate this weakness on a daily basis supports this view. He further reported that, of the 10 to 15% of learners who will eventually drop out of school, over 75% were reported to be experiencing reading difficulties. Jennings et al. (2010:27) draw on an extensive range of challenges which a learner with reading difficulties might experience in the school, social and cultural environments.

As highlighted by Jennings et al. (2010:28), learners experiencing reading difficulties often have unsatisfactory relationships with adults at schools (teachers,

paraprofessionals and principals) that are likely to cause learner dropout. They further elaborate that these learners receive less praise or acknowledgement from teachers, and they are more likely to be criticised, which lowers their self-esteem. In the social environment, learners experiencing reading difficulties also have social difficulties such as making friends because of the low self-esteem (Hisken, 2011:7)

Citing Lavoie (2007), Tur-Kaspa (2002), Wong and Donahue (2002) and Haager and Vaughn (1995), Jennings et al. (2010:28) state that evidence shows that social unpopularity tends to accompany school failure. They further indicate that poor achievers tend to be rejected or ignored by classmates and are uninvolved in extracurricular activities.

This seems to imply that learners experiencing reading difficulties, particularly if they have a long history of failure, often have accompanying emotional problems that impede reading. This view is supported by Jennings et al. (2010:30) who state that emotional problems tend to increase as learners move up through the elementary years and enter adolescence. However, they point out that it is hard to determine whether reading difficulties are the results of underlying emotional problems.

The problems discussed in this section have been highlighted as global trends in reading difficulties. These trends are discussed in the following section.

2.4.1 GLOBAL TRENDS IN READING DIFFICULTIES

Reflecting on the challenges mentioned above, it can be stated that reading difficulties are a global phenomenon and a policy imperative. As a result, the world leaders committed their nations to a global partnership during the United Nations (UN) Millennium Summit held in September 2000 in New York to work together to reduce the extreme poverty. It is now well-established that when learners experience reading difficulties by the age 11, this may have a negative impact on the rest of their lives. They are less likely to go on to secure good qualifications. Their chances of getting a good job and pulling themselves out of poverty are severely diminished. Furthermore, there are substantial wider impacts, such as increased risks of poor health or of ending up in prison (Warren & Paxton, 2014:14).

During the World Education Forum held at Dakar in 2000, 164 nations pledged to achieve Education for All (EFA) by 2015 which is a global commitment or movement

to provide quality basic education for all children (UNESCO, 2000:8). To use reading as a tool to eradicate poverty was one of the Millennium Development Goals (MDGs) to be achieved by 2015. The MDG relevant to this study is Goal 2: “Achieve universal primary education” which can be achieved if all learners can read fluently and with comprehension.

In September 2015, at the 70th UN Assembly, government leaders reviewed the progress of MDGs and adopted 17 Sustainable Development Goals (SDGs)¹² to be achieved by 2030 (Leone, Mead, Paul, Risse & Wagner, 2015:2). The SDG relevant to this study is SDG4: “Quality education” which has the primary aims of ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. UNESCO was entrusted with the leadership and coordination of Education 2030 within the overall SDG agenda. UNESCO’s purpose is to contribute to peace and security by promoting international collaboration through educational, scientific and cultural reforms in order to increase universal respect for justice, the rule of law, and human rights along with fundamental freedom. It has been noted that this purpose can only be achieved if every individual is literate.

That being the case, studies have been conducted globally (as pointed out in Section 1.2.1 to 1.2.3) in an attempt to identify the trends and to provide a dynamic picture of reading educational policies and practices in order to be able to provide proper support. In the following section, this study provides a clear perspective on the implications of reading difficulties globally, in Sub-Saharan Africa and locally. The global perspectives on the implications of reading difficulties reveal that most of the learners experiencing reading difficulties tend to drop out of school.

2.4.1.1 Global learner dropout as a result of reading difficulties

According to recent data released by the UNESCO Institute for Statistics (UIS, 2015), there is a growing number of learners and adolescents who drop out of school before their schooling is complete. Figure 2.3 the data for the school year 2013: 124 million learners and young adolescents between ages of 6 and 15 years have dropped out of school over the last decade.

¹² Sustainable Development Goals is a set of seventeen aspirational "Global Goals" with 169 targets between them. Spearheaded by the United Nations, through a deliberative process involving its 193 Member States, as well as global civil society. The, the goals are contained in paragraph 54 United Nations Resolution A/RES/70/1 of 25 September 2015.

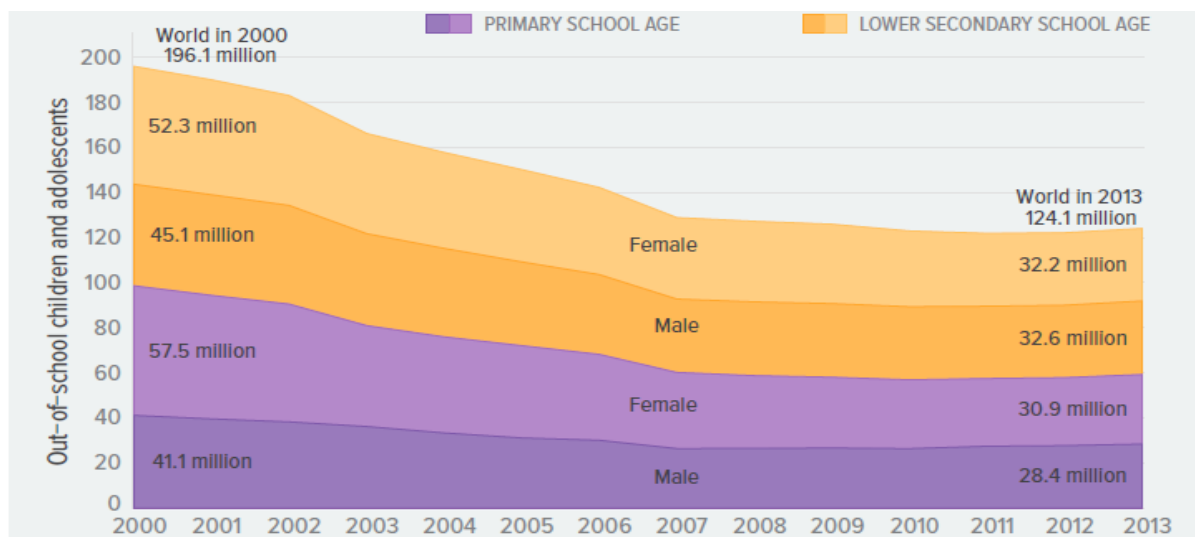


Figure 2.3: Global number of learner dropouts between 2000 and 2013

Adapted from UNESCO Institute for Statistics (2015)

Figure 2.3 illustrates that the number of learners who dropped out of primary school age rose by 2.3 million between 2010 and 2013, reaching a total of more than 59 million learners who could not read, write, or participate fully or optimally in the organisation and activities of their societies (UIS, 2015: 1). This had a negative effect on sustainable development as indicated by the Global Education First Initiative (2012:1)¹³. The initiative uses examples of experiences and statistics from various countries as evidence that sustainable development begins with education. The initiative further asserts that education is a fundamental right and the basis for progress in every country. An important step can be seen in the outcome document of the Open Working Group on SDGs (released in July 2014), which reiterates that education is not only an end in itself but also a means to achieving a broad global development agenda UNESCO, 2014b:10).

The statistics mentioned above, according to Benavot (2015:1-4), distract from the view that reading is viewed as an SDG priority and that literacy can improve health, reduce disease, encourage tolerance and political participation, encourage environmentally friendly behaviour and empower women to make the right decisions.

¹³ Global Education First Initiative is an initiative led by United Nations Secretary-General, Ban Ki-moon. Launched in September 2012, the initiative gathers a broad spectrum of world leaders and advocates who all aspire to use the transformative power of education to build a better future for all.

There is some evidence of research that suggests that education can be obtained through reading. A study conducted by Clark and Formby (2013:3) suggests that reading is a vital skill in finding a job and discovering new things. Most functions in today's society require individuals to be able to read and understand written instructions, such as those on medicine bottles or maps.

Drawing from the UNESCO fact sheet and the position of world leaders on SDGs, it can be concluded that reading difficulties might affect the achievement of SDGs negatively if learners experiencing reading difficulties are not well supported.

2.4.2 Reading difficulties: trends in Sub-Saharan Africa

In Sub-Saharan Africa, learner literacy assessments were conducted with the aim of identifying the United States Agency for International Development's¹⁴ (USAID) progress towards MDG 1: improving reading skills for 100 million children by 2015. According to Research Triangle Institute (RTI) International (2015:1), twenty countries from Sub-Saharan Africa were selected to participate in the literacy assessments because of USAID's presence and continued interest in working to improve educational opportunities within these countries. The twenty countries are as follows: Benin, Côte d'Ivoire (Ivory Coast), Democratic Republic of the Congo, Djibouti, Ethiopia, Ghana, Kenya, Liberia, Malawi, Mali, Mozambique, Nigeria, Rwanda, Senegal, Somalia, South Africa, South Sudan, Tanzania, Uganda, and Zambia.

These countries underwent Early Grade Reading Assessment (EGRA) conducted by UWEZO (a five-year initiative that aims to improve competencies in literacy and numeracy among children aged 6-16 years old in Kenya, Tanzania and Uganda) and SACMEQ over a period of ten years (2005-2015). RTI International (2015) reports that these assessments have consistently provided evidence of relatively low levels of literacy and reading ability across the twenty countries mentioned above. The report adds that the assessments highlight the importance of recognising that there are large variations in scores across languages and across regions and districts within the countries.

Deriving from the reports of RTI International, UNESCO (2015) and ADEA (2006), it is evident that the result of reading difficulties in Sub-Saharan Africa is low literacy levels.

¹⁴ The United States Agency for International Development (USAID) is the United States Government agency which is primarily responsible for administering civilian foreign aid.

As stressed by UNESCO (2014a:7-20), in about 10 countries in Sub-Saharan Africa there are lowest literacy rates for both children and adults. In addition, Uwezo (2013:7-17) reported from the EGRA that they conducted between 2005 and 2015, they found that approximately one-third of adults in Sub-Saharan Africa cannot read or write.

Given the status of development of the Sub-Saharan Africa (being the poorest region in the world), the RTI International (2015) warned that literacy in Sub-Saharan Africa needs to be understood within the context of the continent taking into consideration all realities that affect all aspects of development (such as the political instability, drought and natural disasters, and social unrest) as well as the greatest income inequality and the fastest growing population.

2.4.3 READING DIFFICULTIES: LOCAL TRENDS (SOUTH AFRICA)

In chapter 1 of this study, it was indicated that South African learners participate in several international reading surveys and also carried out a number of national learner achievement assessments. The results of these surveys indicate that the learners' literacy levels are very low and are a cause for great concern (Section 1.2.1-1.2.3). Independent researchers, such as Bharuthram (2012), Ngwenya (2010) and Le Cordeur (2010) also conducted numerous studies that confirm that learners are not reading at the level expected of them in a specific grade. For example, Le Cordeur (2010:67-76) conducted Evaluation Assessment Tests for Reading on intermediate phase learners (Grade 4-6) and revealed that, reading difficulties cause poor academic performance and hamper learners' overall development.

As indicated in chapter 1 (Section 1.4), more research is needed concerning specific support mechanisms for reading difficulties, and how ICTs can help to enhance the learner performance. Most learners are conversant with ICTs and use them to communicate and to search for information, which can be useful and effective when used for supporting learners experiencing reading difficulties. In the section below, different support mechanisms are discussed to identify their effectiveness in supporting learners experiencing reading difficulties.

2.5 SUPPORTING LEARNERS EXPERIENCING READING DIFFICULTIES

Recent developments in addressing reading difficulties have heightened the need for considering different reading stages when supporting learners experiencing reading difficulties. For these learners, there should be a proper support mechanism, and they should first be screened to determine their reading stage and the acquired prerequisites for reading. It is imperative that the reading-screening tools should be in line with Curriculum-Based Measurement (CBM). The CBM is described as a set of standardised and well-researched procedures for assessing and monitoring learners' progress in reading, mathematics, spelling, and writing. Discussed below are reading-screening tools that are used in CBM (Hasbrouck & Tindal, 2006:636-644).

2.5.1 READING-SCREENING TOOLS TO IDENTIFY READING DIFFICULTIES

The reading-screening process, according to Gillet et al. (2012:8), should be done before teaching and learning start at the beginning of the year to determine which learners are experiencing reading difficulties and may need more support during the year. In addition, Lambooi, Fortuin, IJsselsteijn and Heynderickx (2012:84-90) advise that the screening tools teachers use should be as cost-effective as possible because they may be administered to an entire class or entire grade. The different reading-screening tools that are used to identify the learners' level of reading difficulties are discussed in the following sections.

2.5.1.1 Informal reading inventories

Betts (1946) as comprehensive measures of learners' reading abilities first introduced informal Reading Inventories (IRIs). As highlighted by Gillet et al. (2012:10), IRIs are administered to individual learners to examine their word recognition, fluency, comprehension, and overall reading levels. According to Lipson and Wixon (2013:378), IRIs are used to identify strengths and weaknesses in the areas of word recognition and comprehension errors. The reason they are called 'informal' is that they have usually not been norm-referenced by elaborate field-testing with large number of learners.

Examples of IRIs are *Qualitative Reading Inventory* (Leslie & Caldwell, 2006), *Classroom Reading Inventory* (Silvaroli & Wheelock, 2003) and *The Developmental Literacy Inventory* (Temple, Crawford & Gillet, 2008). According to Ascenzi-Moreno

(2016:285-300), IRIs are used to assist teachers in making instructional decisions in support of learners' reading development.

2.5.1.2 Norm-referenced tests

Norm-referenced Tests (NRT) as described by Hussain, Tadesse and Sajid (2015:24) are standardised tests of reading that compare each learner's performance with that of a large number of other learners. However, it is used along with other information to inform decisions about the relevant support mechanism to be used. As recommended by Hasbrouck and Tindal (2016), reading-screening tools should be guided by CBM, according to January, Ardoin, Christ, Eckert and White (2016:310) NRT can be used for Curriculum-Based Measurement in Reading (CBM-R) especially for "nonsense word fluency" and, to a lesser extent, word identification fluency (WIF) because CBM-R is believed to be too difficult for emerging readers. Examples of NRT include the Stanford Achievement Test and the California Achievement Test.

2.5.1.3 Standards-based tests

In recent years, there has been an increasing amount of literature on set standards for achievement in reading in different parts of the world, for example, the US *No Child Left Behind Law*¹⁵. Standards-based tests as described by Miller (2013:112) are tests that aim at mastery of standards. It does not matter that learners might not complete exactly the same activity or exactly the same number of activities because the focus is on what the learner is learning rather than how much the learner is doing. As a result, standards-based tests hold learners accountable for the work they need to do to make progress. However, it leaves teachers free to individualise and leaves learners free to concentrate on learning. According to Gillet et al. (2012:10), standards-based tests are meant to assess each learner's performance on the standard set, which means learners may be promoted to another grade or be retained depending on their performance.

¹⁵ No Child Left Behind Law was a United States of America Act of Congress of 2001, which authorised the Elementary and Secondary Education Act; it included provisions applying to disadvantaged learners.

2.5.1.4 Portfolios

Portfolios, as described by Birgin and Baki (2007:77), are a type of authentic screening tool, as they are collections of learners' works. Nevertheless, they caution that portfolios have been used for different purposes, and it is, therefore, not possible to use only one definition for the term 'portfolio'. Based on their description, the definition of a portfolio may change according to users' purpose and use.

In addition, Gillet et al. (2012:11) state that portfolios in the classroom situation can be maintained by the teacher as a way of keeping a diverse collection of artefacts related to a learner's progress in learning to read. They are usually maintained in collaboration with each learner. The teacher and the learner agree in advance on the sort of items that should be kept in the portfolio which might include a list of books read, a reading journal, repeated reading score sheets, learning logs and reading records.

2.5.1.5 Rubrics

The Glossary of Education Reform¹⁶ (Ed.glossary.org, 2014) describes a rubric as typically "an evaluation tool or set of guidelines used to promote the consistent application of learning expectations, learning objectives, or learning standards in the classroom, or to measure their attainment against a consistent set of criteria". Sharing this view, Gillet et al. (2012:11) further explain that rubrics have the advantage of allowing teachers to observe and evaluate authentic performance, such as the learner's oral reading. Mijuškovi (2014:252) presents an example of using a rubric for screening reading skills where he outlined the screening of learners for reading comprehension. He cautions that, when using rubrics, one should make sure that there are clear and precise goals. Furthermore, he advised that a collaborative approach is needed in which the emphasis is on achieving long-term educational goals.

2.6 READING SUPPORT MECHANISMS

In supporting learners experiencing reading difficulties, support mechanisms and intervention strategies are terms which are used interchangeably. For the purpose of this study, the term used is 'support mechanism'. Gunning (2013:536) describes a support mechanism as "the systematic process of assessment and planning employed

¹⁶ The Glossary of Education Reform is a comprehensive online resource that describes widely used school-improvement terms, concepts and strategies for journalists, parents and community members.

to remediate or prevent a social, educational, or developmental problem". In this study, support mechanism is viewed as a systematic plan of action consciously adopted in an attempt to address reading difficulties and reduce the causes of academic failure.

Many published studies, including Gunning (2013) and Mphahlele (2013) describe support mechanisms for learners experiencing reading difficulties. However, no attempt has been made to quantify the association between the support mechanisms and the learners' academic performance. Another worrying factor is that, despite a number of support mechanisms mentioned in the recent research, reading difficulties are still regarded as a worldwide.

This section is aimed at exploring various support mechanisms available to support learners experiencing reading difficulties. The relevant support mechanisms can only be identified upon the identification of the correct or a relevant stage of reading of a learner and possible contributing factors as indicated in the discussion above.

It has been suggested by Daly et al. (2015:18) that, to facilitate reading support, one needs to verify the capacity of organisational systems of the classroom, school and the school district. This study was conducted in FSS where the organisational systems are slightly different from the ordinary schools. In the FSS, the learner is not only supported by the teacher, there are also other specialists such as psychologists, speech therapists, social workers and LSEs who form part of the SBST. Educational processes such as Screening, Identification, Assessment and Support (SIAS) also guide the support.¹⁷ The SIAS process is explained in detail below under the section of FSS as a support strategy (section 2.7)

For the purpose of this study, only three support mechanisms were explored namely: Response to Intervention, ICTs and Scaffolding.

2.6.1 Response to intervention

The RTI can be defined as a multi-tier approach to the early identification and support of learners experiencing reading difficulties (Rasinski et al., 2010:16). They further advised that RTI can be successful only if teachers monitor learners' daily progress. Similarly, Gunning (2013:28) provides in-depth analysis of RTI and indicates that the

¹⁷ Screening, Identification, Assessment and Support is a policy provides standardised procedures for supporting learners to ensure that ALL children may access quality education and achieve to the best of their ability (DBE, 2014: 10)

process begins with high-quality instruction and universal screening of all children in the general education classroom. He further draws our attention to the fact that, when using RTI, learners experiencing reading difficulties are provided with support at increasing levels of intensity to accelerate their rate of learning.

The first step in RTI as indicated by Gunning (2013:29) is to screen all learners to identify those experiencing reading difficulties. It is recommended that the screening process is administered three times a year for learners who fall behind. Furthermore, Daly et al. (2015:228) encourage teachers to consider the prerequisites for reading the learner have acquired in order to administer the relevant tier of RTI. As indicated in the definition, RTI is a multi-tier approach. The most commonly used tiers in schools Tier 1, 2 and 3 as illustrated in Figure 2.4.

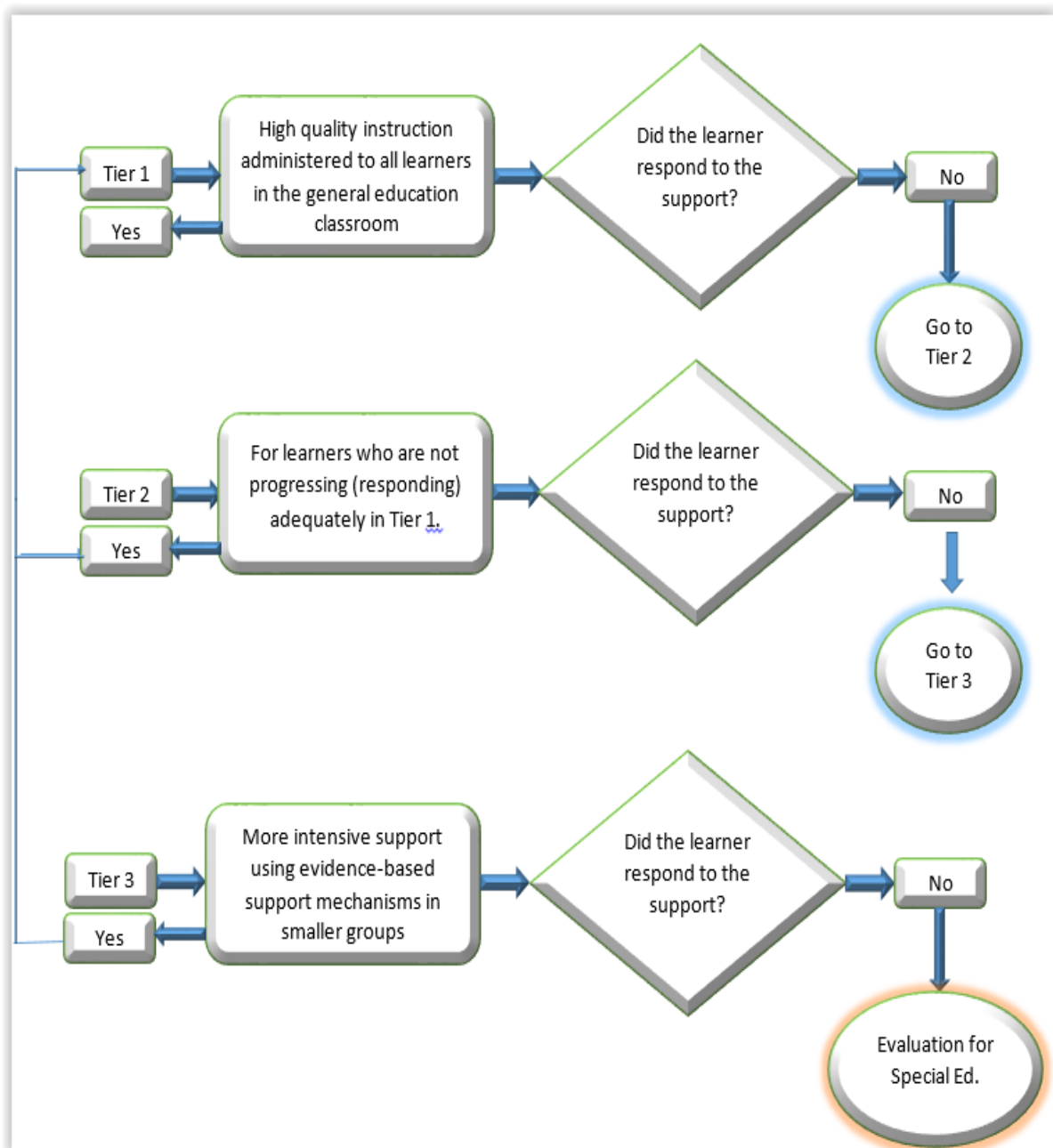


Figure 2.4: Three tiers in RTI

Adapted from (Jennings et al., 2010:8)

From the figure, it is apparent that the RTI is a cycle of support. In Tier 1, all learners are supported and those who do not respond to the support mechanism are referred to Tier 2 and those who respond well remain on the same level of support. In Tier 2, learners are given additional high-quality support in a smaller group. Learners who are not responding adequately to the support mechanism in Tier 2, are referred to Tier 3 while those who responded well are referred back to Tier 1. In Tier 3, learners are

given support that is even more intensive in smaller groups, and learners who do not respond well to the support are recommended for comprehensive evaluation or assessment that may determine either placement in special education or further support at the lower level. Learners who respond well to the support in Tier 3 are referred back to Tier 2 and 1 respectively according to their progress.

2.6.2 Information communication technologies

2.6.2.1 Definitions

Information Communication Technologies according to UNESCO (2015:14) are often associated with high-tech devices, such as computers and software, but ICTs also encompasses more conventional technologies such as radio, television, telephone technology, video, DVD, satellite systems, mobile phones as well as equipment associated with video-conferencing.

The term ICTs as defined by Freeman and Hasnaoui (2011:6) are technologies such as desktops, laptops, software, peripherals and connections to the internet that are intended to fulfil information processing and communication functions. Perron, Taylor, Glass and Margerum-Leys (2010:67) provide a broad definition by stating that ICTs are technologies used to convey, manipulate and store data by electronic means such as SMS text messaging, email, video chat (e.g. Skype) and online social media. For example, for learners experiencing reading difficulties, text-to-speech systems assist in the following manner: The text that a learner wishes to read is scanned into a programme, once scanned in, it is read by the computer's voice synthesiser and simultaneously highlighted on the screen so that the learner can follow along. In addition, text-to-speech systems have a number of useful tools that are available, including an audible spell checker, note-taking feature and access to a dictionary and other reference material.

Another study conducted by van Wyk and Louw (2008:253) highlights the success of the use of a Technology Assisted Reading Programme as a way to address reading difficulties; however, only the use of computers for the programme were emphasised and no other technologies which form part of the ICTs.

Drawing from the definitions above, for the purpose of this study, ICTs are described as technologies that are used to create, share, transmit, or exchange and store

information. This definition relates to the main research question of this study which was formulated as follows: *What role do ICTs play in supporting learners experiencing reading difficulties in the selected FSS?*

2.6.2.2 Connotations

The concept ICTs carries diverse connotations. It has political and scientific implications. I start this discussion with its political implications and end with its scientific implications. On a political level, ICTs in education are classified as a constraint Frempong (2012:4). In discussions at the 2002 International Telecommunication Union (ITU) conference, among other things, delegates determined actions to narrow the digital divide, including a view of the World Summit on the Information Society ¹⁸(WSIS). One of WSIS chief aims was to bridge the so-called global digital divide separating rich countries from poor countries by spreading access to the internet in the developing world (Berry, 2006:1).

In breaking the digital divide, it was imperative for WSIS to consider sub-Saharan countries, including South Africa, through the involvement of UNESCO which co-organised statistical, capacity-building workshops in 2013 and 2014 to train statisticians in ministries of education to collect and report data on ICT in education. In Sub-Saharan countries, ICTs are viewed as of paramount importance to the future of education and are most likely to contribute successfully to meeting the EFA and SDGs. According to Frempong (2012:26), Ghana, Kenya, and Uganda are examples of countries that promote the access, use, and integration of ICTs within their school systems. However, ICT use is not directly linked to supporting learners experiencing reading difficulties, which is a gap I identified, considering the importance and impact ICTs can have on the acquisition of literacy.

Scientifically, the use of ICTs in education was influenced by the two major theories of learning, behaviourism and constructivism. For the purpose of this study, only constructivists' views are considered, especially Vygotsky's sociocultural theory that posits the provision of socially-rich environments in which learners can explore knowledge domains with their fellow learners, teachers and outside experts. According

¹⁸ World Summit on the Information Society (WSIS) is the world's largest annual gathering of the 'ICT for development' community

to Mphahlele (2013:41), ICTs can be used to support the learning environment by providing tools for discourse, discussions, collaborative writing, and problem-solving.

Vygotsky (1978a:35) provides a way to understand the relationship between the mechanistic aspect of ICTs, the development of literacy, fluency and integration of ICTs, the formation of social relationships because of these activities, and the learning that occurs as a consequence of such engagement. His sociocultural theory is discussed in detail in the second section of this chapter.

As indicated in Table 2.1 and 2.3 and the PIRLS results above, the support mechanisms provided to learners are having a limited effect; however, there are several studies which reveal that learners using ICTs show higher learning gains than those who do not use ICTs (Mikre, 2011:5). Most studies in the field of ICTs in education have only focused on the use of ICTs to improve learner performance in certain subjects, or to enhance teaching and learning; for example, Hudson and Porter (2010: 1-11), Amin (2013) and UNESCO (2015).

The findings from Hudson and Porter's study reveals that learners learn in a more effective, efficient and fun way which suggests that ICTs may help learners experiencing difficulties to improve their confidence level (Hudson & Porter, 2010:2). Amin (2013:38-45) states that ICTs provide for many opportunities for constructivist learning because they are learner-centred and enable learning to be related to context and practice.

Based on the above findings, it is worth noting the imperative of exploring ICTs as a support mechanism for learners experiencing reading difficulties, especially in the FSS.

2.6.3 Scaffolding

Scaffolding is the term that was first used by Wood, Bruner and Ross (1976:89-100) as a metaphor in the learning context. They used the term to describe the nature of parental tutoring in the language development of young children. They showed that parents who were 'successful scaffolders' focused their children's attention on the task at hand and kept them motivated and working on the task (Hammond & Gibbons, 2005:8-9). Bruner (1978:242) defines scaffolding as: "... the steps taken to reduce the

degrees of freedom taken in carrying out some task so that the child can concentrate on the difficult skill she is in the process of acquiring”.

In the classroom context, scaffolding is defined as the role of teachers and others in supporting the learner’s development and providing support structures to get to that next stage or level (Vygotsky, 1978b:176). Vygotsky’s definition of scaffolding links with the support of learners who are experiencing reading difficulties in the sense that a learner should get support in order to move from one reading stage to the next as described in Section 2.2.2 above. Research reveals that the scaffolding facilitates a learner’s ability to build on prior knowledge and internalise new information. An important aspect of scaffolding instruction is that the scaffolds are temporary. As the learner’s abilities increase, the scaffolding is progressively withdrawn. Finally, the learner is able to complete the task or master the concepts independently (Chang, Sung, & Chen, 2002:7).

Scaffolding as a support mechanism is considered relevant when supporting learners experiencing reading difficulties because it provides individualised support based on the learner’s ZPD. The ZPD, as described in 1.3.1, is also explained in detail in Section 2.6.3 below. Therefore, the goal of using scaffolding when supporting a learner experiencing reading difficulties is for the learners to become independent, fluent and self-regulating learners who read with understanding.

One of the primary benefits of scaffolding is that it engages the learner. The learner does not passively listen to information presented; instead, the teacher prompts the learner to build on prior knowledge and form new knowledge. Working with learners who have low self-esteem and reading difficulties provides an opportunity to give positive feedback to the learners by saying things like “...look what you have just figured out!” This gives them more of a ‘can-do’ versus a ‘this is too hard’ attitude. This leads to another advantage of scaffolding in that, if done properly, scaffolding instruction motivates the learners so that they want to learn. Another benefit of this type of instruction is that it can minimise the level of frustration of the learner (Van Der Stuyf, 2002:11).

It is important to note some of the disadvantages of using scaffolding when supporting learners experiencing reading difficulties. For an over-subscribed classroom, it could be extremely time-consuming for the teacher to develop the supports and scaffold

lessons to meet the needs of each individual learner. Another disadvantage is that, unless properly trained, a teacher may not properly implement scaffolding instruction and therefore not see the full effect (Van Der Stuyf, 2002:12).

2.7 FULL-SERVICE SCHOOLS AS A SUPPORT STRATEGY TO ADDRESS READING DIFFICULTIES

In Chapter 1 (Section 1.2.4), the FSS was introduced as a support strategy referenced from EWP6. A short description, target learners, functions and the support systems were also delineated in Section 1.2.4. The DBE (2010:19) emphasises that the establishment of FSS is one of the key strategies in the development of a single, inclusive system of education in which all learners will have access to support. It has been the designation and phased conversion of a number of mainstream/ ordinary, primary schools in the District/Circuit/Cluster to be furnished with extra human resources (therapists and LSEs) in order to provide quality education to all learners.

The initiative of FSS as a support strategy was based on the implementation of Education White Paper 6 (EWP6). The EWP6 can be described as the inclusion policy that was introduced as part of responding to the global mandate resulting from the World Conference on Special Needs Education, Salamanca, Spain in June 1994. During the conference, 92 governments and 25 international organisations were represented including South Africa. The mandate was issued in the conference, calling for all nations to make an inclusion inclusive education to be the norm. South Africa in response to the mandate, initiated EWP6: Building an inclusive education and Training System in 2001 (UNESCO, 2005:9).

The Education White Paper 6 places an emphasis on supporting learners through FSS depending on their required level of support as outlined [in](#) Figure 1.2 in chapter 1. According to the EWP6 (DoE, 2001:22), FSS are first and foremost mainstream primary education institutions that provide quality education to all learners by catering for the full range of barriers to learning in an equitable manner. It further elaborates that FSS is an institution that should strive to achieve access, equity, quality and social justice in education.

The above definition of FSS is consistent with Kronick (2002:14) who defines FSS as a school, which serves as a central point of delivery, a single community hub for whatever learning support required/needed. The EWP6 (DoE, 2001:22) stresses that

FSS are institutions that are responsive to a range of barriers to learning such as reading difficulties, writing difficulties, non-verbal learning difficulties, mathematical difficulties and psychosocial barriers. In this study, only reading difficulties as one of the barriers to learning experienced in the FSS are considered.

For the FSS to provide a moderate level of support to learners fully as expected (as outlined in Section 1.2.4), there is a team of teachers called the SBST or ILST. For the purpose of this study, the term that is used is SBST as it is used in schools' practice. The DoE (2001:29) defines an SBST as the structure that supports the teaching and learning process by identifying and addressing learners, teachers and schools' barriers to learning. All schools should have an SBST comprising of teachers with different roles in the school (such as assessment, admissions and different subjects). However, the difference with FSS is that their SBSTs have additional members who form the support staff such as social workers, psychologists and school nurses who are not available in other ordinary public schools.

This study took place in the Gauteng Province of South Africa, where currently 75 ordinary, public primary schools have been converted into FSS. The GDE has 15 District offices, and each District is currently piloting five FSS; hence, the whole province has a total of 75 FSS.

Strengthening the support in the FSS, GDE employed LSEs and placed them only in the FSS. LSEs are those teachers who have specialised competencies to support learners experiencing barriers to learning (Mahlo, 2011:16). LSEs can also be described as teachers with experience and expertise in the field of inclusive education background (DoE, 2004:3). LSEs mainly support the SBST to ensure that most of the barriers to learning are addressed. They capacitate SBSTs in developing support mechanisms for the identified learners.

Learners experiencing barriers to learning are identified using different identification or screening methods/tools as discussed above (Section 2.5.1.1 to 2.5.1.5). Only learners requiring a moderate level of support are recommended to be supported in the FSS. As mentioned in chapter 1 of this study, learners who require high levels of support are referred to special schools, while those who require low levels of support remain in the ordinary public schools. All these processes are done in consideration of SIAS, which is explained below.

Apart from the fact that FSS have additional human resources to support learners, they have additional physical resources such as computers, internet, television, smart boards and tablets for learners. The FSS, which was selected as a suitable research site for this study, is not only a physical structure equipped with supporting resources but is part of the support strategy itself. It should also be noted that the FSS, with its additional resources, is expected to provide support to other primary schools in the vicinity, which is another reason for its appropriateness for this study.

The reading-support mechanisms, especially ICTs, FSS as a support mechanism and the aims of this study are integrated with the theories that underpin this study in the following section.

2.7.1 Screening identification assessment and support

The purpose of the SIAS policy is, inter alia, to provide a policy framework for the standardisation of the procedures to identify, assess and provide programmes for all learners who require additional support to enhance their participation and inclusion in school (DBE, 2014:10). There is an alignment with the inclusive education policy (EWP6), which formed part of the discussion in Section 1.2.4. The alignment includes the roles and functions of schools that have been designated as FSS (Figure 1.2), one of which is to provide a moderate level of support to learners. The SIAS process is a cycle of activities, which start with the screening of a learner by the teacher in the classroom as, illustrated in Figure 2.5 on the next page.

Figure 2.5 presents the activities that are involved in a SIAS process. The figure shows that the screening starts during the enrolment stage when a learner is being admitted into a school. The information gathered during enrolment will guide the teacher as to whether to perform another screening or not. The outcomes of the screening done by the teacher will provide guidance to the teacher as to whether health and disability aspects of the learner need to be assessed. If that is the case, the teacher will refer the learner to a health professional who will fill in the Disability & Health form which is found in the SIAS policy. At the next step, the teacher will in Special Needs Assessment (SNA) form 1, which is the Individualised Support Plan (ISP), used to record the support given to the learner.

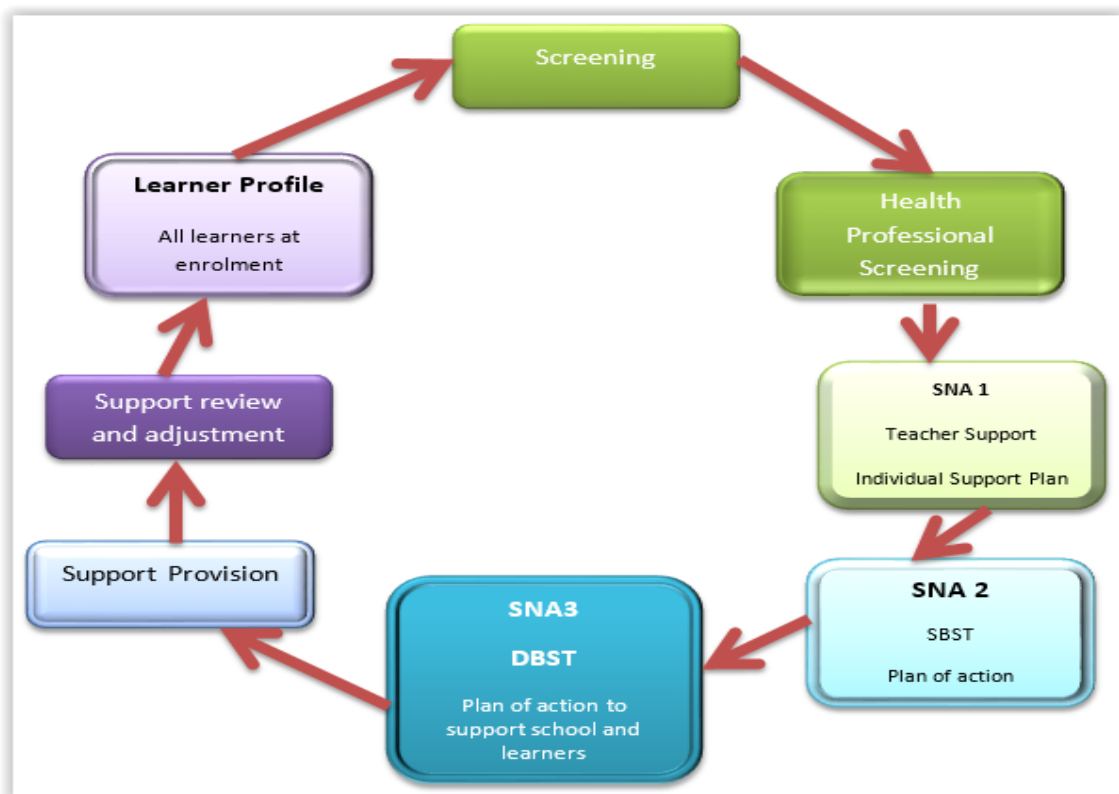


Figure 2.5: SIAS cycle

Source: DoE (2014: 37)

If the support provided with the ISP yields little or no progress, the learner will be referred to the SBST by means of an SNA2 form. The SBST will draw up an action plan to support the learner. If the outcomes of support show little or no improvement, the SBST will fill in the SNA3 form to refer the learner to the DBST. The DBST will draw up an action plan to support both the school and the learner.

All relevant stakeholders listed under support provision will provide the support and that support will be reviewed by first assessing the learner. The assessment referred to in this section does not refer to the assessment of learner scholastic achievement, but to assessment to determine the effect of support and level of functioning of the learner after the first screening and participation to determine further support needs. The process will start over again after the review, but other activities like screening by health professionals will be done as part of follow-up of the support provided.

The aim of SIAS is to design support programmes in such a way that learners access to learning and optimise their academic performance. A learner experiencing reading

difficulties without support cannot access learning, but the one who is supported with a relevant support mechanism can access learning with ease.

2.8 THEORETICAL FRAMEWORK

The previous section of the literature review contextualised what reading is, described the reading difficulties and outlined how learners experiencing reading difficulties can be supported using support mechanisms. This section provides the theoretical framework and principles for consideration in supporting learners experiencing reading difficulties by expanding on the contextual framework referred to in Chapter 1. This section also provides a platform to further interpret and examine the relevant support mechanism, in this case, ICTs, for learners experiencing reading difficulties.

This section further elaborates on and focuses the discussion on the three main theories that form the pillars for this study namely: Vygotsky's sociocultural theory (Vygotsky, 1978b), Reader-response Theory (Gunning, 2013), and e-Reading theory (Ortlieb, 2014).

Grant and Onsaloo (2014:13) as the outline for the entire thesis inquiry define a theoretical framework. They further assert that a theoretical framework serves as the guide on which to build and support a study and provides the structure to define how the dissertation is approached philosophically, epistemologically, methodologically, and analytically as a whole. Eisenhart (1991:5) defined a theoretical framework as a structure that guides research by relying on a formal theory constructed by using an established, coherent explanation of certain phenomena and relationships.

Thus, the theoretical framework consists of the selected theory (or theories) that undergird the researcher's thinking with regard to how he/she understands and plans to research his/her topic, as well as the concepts and definitions from that theory that are relevant to the topic. Grant and Onsaloo (2014: 13) state that criteria for applying or developing theory must be appropriate, logically interpreted, well understood, and aligned with the question at hand.

Many recent studies (Lysaght, 2011; Anderson, Day & McLaughlin, 2006) have shown that the theoretical framework is the foundation from which all knowledge is constructed (metaphorically and literally) for a research study. In addition, Lysaght (2011:170) states that the theoretical framework serves as the structure and support

for the rationale of the study, the problem statement, the purpose, the significance, and the research questions. Based on the above definitions, for the purpose of this study, the theoretical framework serves as a grounding base, or an anchor, for the literature review, and most importantly, the research methods and analysis of data.

The overarching theoretical framework for this study was formed by Vygotsky's sociocultural theory, which was integrated with the Reader-response theory and e-Reading.

2.8.1 Vygotsky's sociocultural theory: zone of proximal development

The work of Lev Vygotsky and other developmental psychologists has become the foundation of much research and theory in developmental cognition over the past several decades (Wertsch, 2007:178). Vygotsky's sociocultural theory of human learning ties neatly with the use of ICTs in addressing reading difficulties because it describes learning as a social process and the origination of human intelligence in society or culture. Bloome (1985:134) states that, in addition to being a communicative process, reading is also a social process. He further indicates that reading involves social relationships among people: teachers and learners; parents and children; and readers and authors through the establishment of social groups.

With the recent development of social media, reading in social groups is more possible. Short-message-system (SMS) and other social media can be related to Vygotsky's sociocultural theory of human learning, as the major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition. Vygotsky believed everything is learned on two levels: first, through interaction with others, and then by integration into the individual's mental structure. For example, when learners are asked to read a story, they can do so in socially appropriate ways, silently or orally, individually, competitively, or cooperatively with other learners. In this regard, learners who read orally without error or who appropriately answer teacher's questions about the story may gain a social status within the classroom. Vygotsky (1978b:40) argues that learning is a necessary and universal aspect of the process of developing culturally organised, specifically human psychological function. In other words, social learning tends to precede development. "All the higher functions originate as actual relationships between individuals" (Vygotsky, 1978b:37).

According to Wertsch (2007:179), Vygotsky's theories on cognitive development have two main principles: The More Knowledgeable Other (MKO) and the ZPD. The MKO is somewhat self-explanatory. It refers to someone who has a better understanding or a higher ability level than the learner with respect to a particular task, process, or concept. On the other hand, the ZPD forms the basis of the scaffolding component of the cognitive apprenticeship model of instruction: "...the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978b:38).

The focus of this study on Vygotsky's sociocultural theory was on the ZPD (as indicated in chapter 1: Section 1.3.1, because Vygotsky believed that when a learner is at the ZPD for a particular task (in the context of this study: reading), providing the appropriate assistance (scaffolding) will give the learner enough of a motivation to achieve the task. In the context of this study, the use of ICTs as a support mechanism requires the assistance of the teacher, and it was indicated in Section 2.6.2 that ICTs could be used for collaborative learning, meaning that learners can learn to read collaboratively with their peers.

The ZPD is also defined by McLeod (2010:6-9) as the difference between what a learner can do without help and what he or she can do with help. The discussion of reading stages in Section 2.2.2 showed that, for learners to be able to move to the next stage, they should demonstrate mastery of the current stage without the help of the teacher. ICTs can provide the learner with scaffolding to move from one reading stage to another or to improve learner's reading abilities which, at the same time, assist with the acquisition of prerequisites for reading. The ZPD is illustrated [in](#) Figure 2.6.

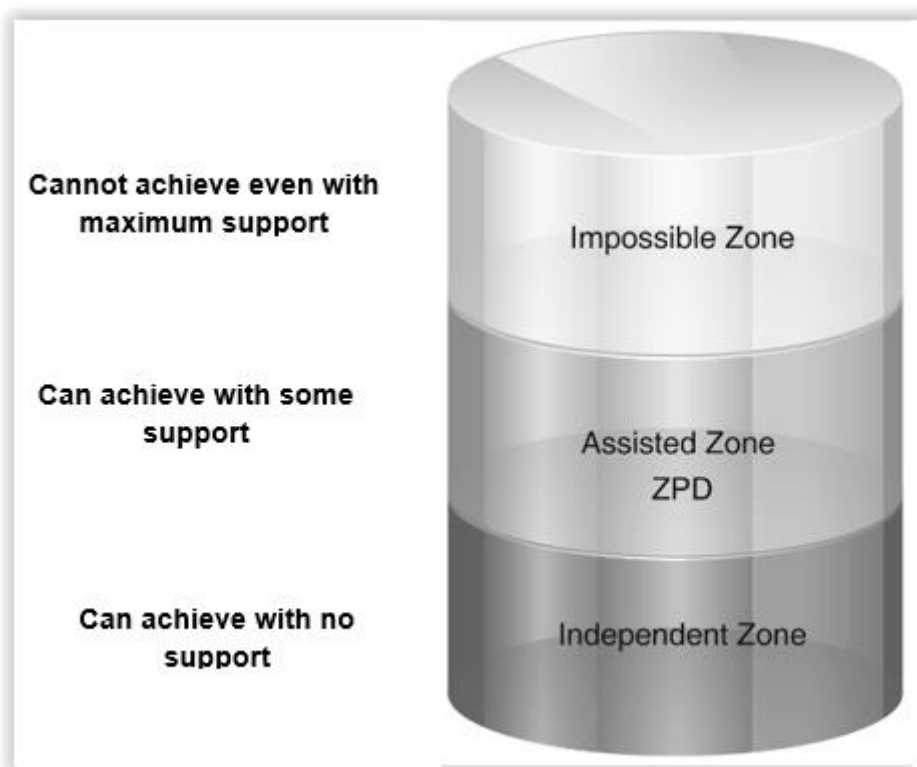


Figure 2.6: Zone of proximal development

Source: McGrath and Elison (2014: 6)

As shown in Figure 2.6, there are three zones learners experiencing reading difficulties might find themselves in (that is impossible, assisted and independent zones). McGrath and Elison (2014:126) demonstrate that continuous lack of support in the ZPD (assisted zone) might result in the impossible zone where no amount of support will make a difference. This can be related with the discussion on section 2.2.2 on reading stages. Given the background of FSS in section 2.7, it is worth pointing out that most of the learners experiencing reading difficulties in the FSS are on ZPD (assisted zone) as indicated by Figure 2.6.

With on-going support and practice in the ZPD, learners experiencing reading difficulties can become proficient and can read independently. For the learners experiencing reading difficulties to move to the independent zone, teachers need to structure the reading tasks so that learners are challenged appropriately and adjusting the amount of teacher support based on the learner's reading level and prerequisites for reading acquired.

From the definition of reading in section 2.2, it was evident that learning to read can be regarded as intentional learning. Taking into consideration the support mechanisms explored in 2.6 and the illustration of Figure 2.6, it is worth noting that learning how to read involves collaborative learning, discourse, modelling, and scaffolding, which are strategies for supporting the intellectual knowledge and skills of learners and facilitating intentional learning according to ZPD as described by Vygotsky (1978b:33).

Enochsson (2009:1) states that a teacher has to find out the level of the learners' knowledge and understanding in a certain area. Building on this, is the most successful way for a learner to develop her or his knowledge further (Vygotsky, 1999:131). In the context of this study, Section 2.3, 2.5.1 and 2.6 apply because they are about screening the learner to identifying possible contributing causes of reading difficulties and the learner's stage/level of reading before administering the relevant support mechanism.

Liu (2012:991) identified ZPD gaps in relation to ICT use such as translation software, online mapping, demonstration and scenario tools, web conferencing tools, and course management tools. His study revealed that ICTs can reduce the ZPD gaps to a minimum by providing a learner-centred, intellectually-stimulating and technologically-advanced teaching. Although this study was not directly related to teaching reading, learner-centred and intellectually-stimulating teaching are of utmost importance in teaching reading.

The ultimate role of reading is to comprehend, and all the strategies mentioned above are needed to get the learner to read independently and fluently with comprehension.

2.8.2 Readers-response theory

The readers-response theory is part of literary theory that focuses on the reader (or audience) and their experience of a literary work, in contrast to other reading theories that focuses their attention primarily on the author or the content and form of the work. The work of Reader-response theorists, generally defined, seeks then to argue that there is a necessary correlation between the work of an audience and the work of the reader and of reading itself (Elsherief, 2017:23).

The Readers-response theory debate began in the 1960s and 1970s particularly in the US and Germany, in work by Norman Holland, Stanley Fish, Wolfgang Iser, Hans-

Robert Jauss, Roland Barthes, and others. Important predecessors were Richards (1929), who analysed a group of Cambridge undergraduates' misreadings; and Rosenblatt, who, in *Literature as Exploration*, argues that it is important for the teacher to avoid imposing any preconceived notions about the proper way to react to any work (Rosenblatt: 1995:61). In this case, work is referred to as 'reading'.

Previous studies have demonstrated how the learner can have a dialogue with the text (Probst, 1998:32). The emphasis on Readers-response theory is that readers do not passively consume the meaning presented to them by an objective literary text; rather, they actively make the meaning they find in literature (Tyson, 2006:170). Then again, Gunning (2013:436) expands on Probst's work by stating that reading implies having a dialogue with the text, by defining reading as a transaction in which a reader affects the text and vice versa. Gunning further refers to the reader and the text as two aspects of a dynamic situation. He emphasises that there should be personal responses and interpretations during the reading process and encourages learners to make personal connections to what they have read.

Suggesting a way to elicit Readers-response theory for positive reading outcomes, Gunning (2013:6) and Iskhak (2015:49) describe four general steps namely: (1) creating a reader-response environment; (2) preparing to read a literary piece; (3) reading a literary piece; and (4) small-group discussion. Steps 1 and 4 share commonalities with the ZPD where cognition and environmental input are interrelated. ZPD's scaffolding and collaborative learning strategies mentioned in 2.8.1 above, tie in well with all the steps as follows: Steps 1 and 2 take place under the teacher's guidance; in step 3, the learner is reading as an individual; and in step 4, the learner is reading collaboratively with the learner's peers.

Taking a step back to Vygotsky's sociocultural theory, it is mainly focused on the social and cultural aspects of the learner's development and how they influence the learner's learning. In relation to Readers-response theory, Gunning (2013:9) stresses that reading from a transactional perspective, building a background (social and cultural) becomes very important because it enriches the transaction between the reader and the text.

In support of the use of Readers-response theory in teaching learners how to read, Kramsch (2015) views reading as a process, not a product. He describes reading as

the intersection between the reader (or learner) and the text. He also aligns his argument with Vygotsky's sociocultural theory by indicating that as Applied Linguistics lean towards the social and the cultural context of language practices, the field of language socialisation has made great strides.

In testing the hypothesis of this study which was formulated to establish the effects of ICTs as a support mechanism on learners experiencing reading difficulties in the FSS, the integration of Readers-response and Vygotsky's sociocultural theories is vital. It has conclusively been shown by several studies that ICTs allow cooperative and peer learning which is evident in the fourth step of Readers-response theory and again in Vygotsky's sociocultural theory where it is stated that learning takes place through interaction with others.

2.8.3 e-Reading theory

The e-Reading theory as explained in chapter 1 (Section 1.3.3) differentiates between electronic formats and the traditional reading of print. This also accords with readers-response theory, which showed that learners make personal connections to what they have read. Ortlieb (2014:245) emphasises that, with the varied text structures and interactive text features, attention turns to the theoretical foundations that underpin digital literacy learning today. He also explains how information is sought and retrieved when reading new information from digital media.

According to Shizha (2013:101), studies in the United States show that primary school learners who used tutorial software in reading scored significantly higher on reading scores. He further concludes that the use of ICTs in education contributes to constructivist learning and an increase in activity and greater responsibility on the part of the learner. This limits the role of the teacher to supporting, advising, and coaching learners rather than merely transmitting knowledge.

Another study conducted by Nowak (2008) on e-Reading theory and its relationship to academic reading, revealed that as readers adjust to the digital medium, certain new factors are introduced to the reading process. Nowak (2008:2) points out that digital text presents less material than text on a page but can act in different ways than print text. Supporting Nowak's finding is Ortlieb (2014:246), who further opined that when reading digital text, simply making one's way through the text often requires more thought and practice than required when reading print texts. It is of importance that,

when using e-Reading theory, teachers should address the current digital literacy needs of their learners, thus preparing them for challenges in the 21st century. Again, one should note that varying text structures within digital formats are the scaffolds that learners need today (Ortlieb, 2014:247).

According to e-Reading theory, the act of reading consists of three parts: manipulation, comprehension, and interpretation. There is some evidence to suggest that in many cases, manipulation of traditional print texts is often overlooked in the act of reading, but this aspect of the reading process is growing in importance with e-Reading. Gervais (2007:183) further stresses that, if a text cannot be manipulated, learners will have difficulty in understanding and interpreting the text. That brings us to the relationship between the learner and the text in which the meaning is created.

Relating the e-Reading theory with the other two theories discussed above, the common denominational word between the three theories is scaffold. In Vygotsky's sociocultural ZPD and the Readers-response theories, the teacher and competent peers form part of the scaffolding, while in the e-Reading theory the digital text is regarded as the scaffold. Based on the discovered link between the three theories, it can be noted that these scaffolds can be used in collaboration with ICTs as a support mechanism for learners experiencing reading difficulties. As the learners become more proficient, they can gradually be weaned off the support mechanism to become independent readers. The ZPD as described by Vygotsky (1978b:34) emphasises that the learner should not be entirely dependent on the scaffold.

The above discussion provides a view that sociocultural interaction is necessary for success in the teaching and learning of reading. It is also my view that the sociocultural interaction could allow learners, knowledgeable peers, and teachers to establish cross-social understanding that helps learners to gain a level of comfort, which widens their level of competence. The relationship between Vygotsky's sociocultural, Readers-response and e-Reading theories as discussed above is illustrated in Figure 2.7.

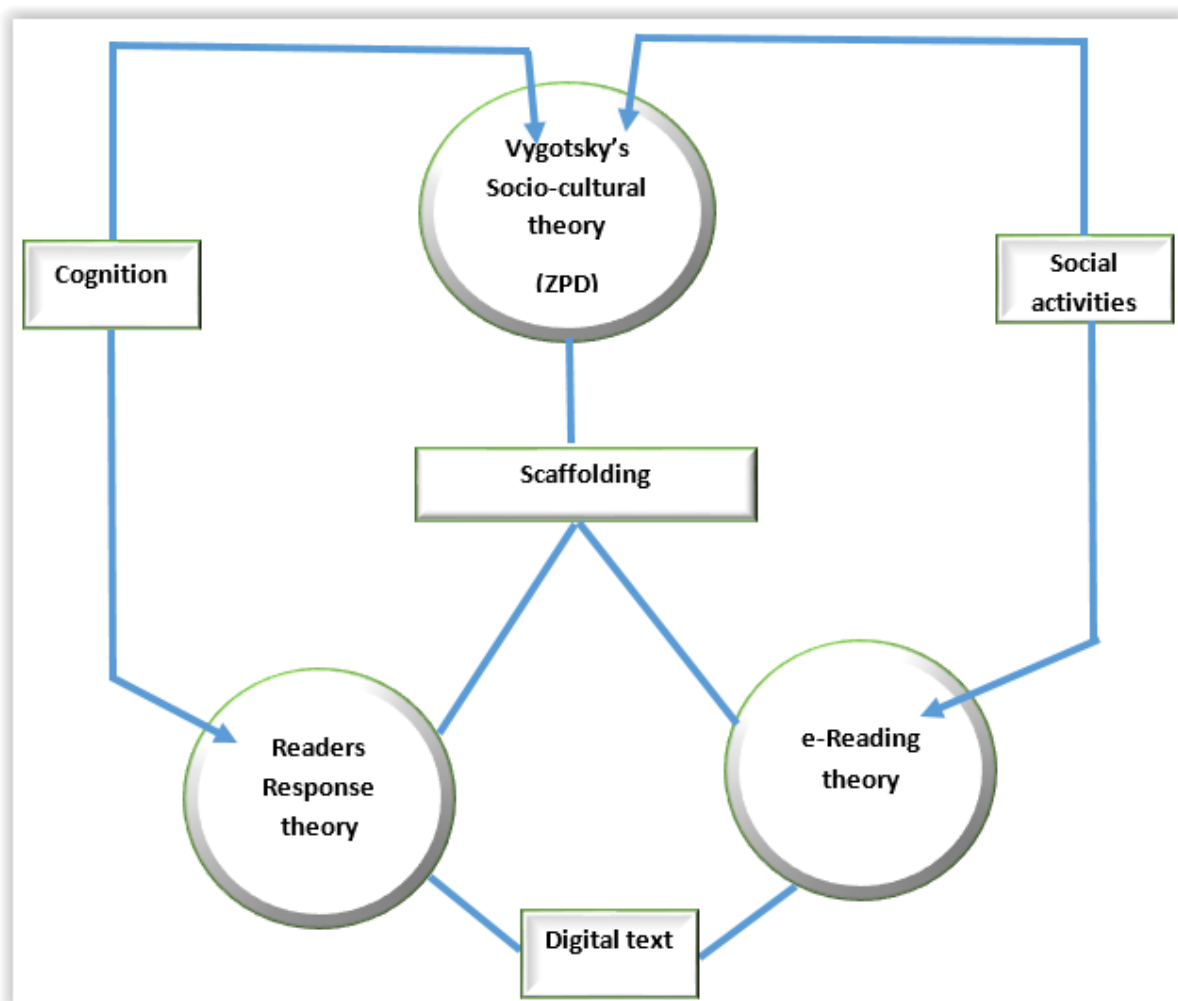


Figure 2.7: The relationship between the three theories

It is apparent from Figure 2.7 that teachers use the concept of scaffolding which also exist in all the three theories to support learners experiencing reading difficulties. Understanding ZPD helps teachers to scaffold reading material for learners in order to understand the processes of reading and to be able to navigate through the different reading stages at the same time increasing their level of reading competence. Figure 2.7 illustrates Vygotsky's notion that social interaction plays a fundamental role in the development of cognition and social activities of which scaffolding is crucial to a child's development as a learner.

Mediation in the form of ICTs with digital text ensures that diverse learner interests and abilities are catered for. The most important aspect illustrated in Figure 2.7 is that effective scaffolding certainly has a great positive effect on reading competency.

2.9 CHAPTER SUMMARY

The purpose of this chapter was to provide an overview of the literature with regard to reading as a phenomenon and important aspects relating to reading. The overview led to explaining reading difficulties in relation to challenges, trends and the implications, especially for the SDGs. The three theories that form part of this study's theoretical frameworks, which relates to supporting learners namely, Vygotsky's sociocultural theory, Readers-response theory and e-Reading theory were discussed. The theoretical framework, developed through an integrated view of the individual theories, relates to the crucial role that scaffolding plays in supporting learning strategies or support mechanisms. Each theory that forms part of the theoretical framework was discussed with regard to the background and principles, which pertain to supporting learners experiencing reading difficulties.

The following chapter (Chapter 3) describes the research methodology, including the paradigm, research design and the instruments and the population and sample. In addition, data collection, the processes of analysis and the ethical considerations are delineated.

CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

In chapter 2, literature pertaining to the significance of supporting learners experiencing reading difficulties using ICTs was reviewed. In addition, the theories that form the theoretical framework, which relates to supporting learners experiencing reading difficulties were also discussed and integrated. In this chapter, the research methodology (that comprises the research paradigm, the research approach and the research design) is linked to the theoretical framework. The link is further expanded to the sampling procedures, data collection methods and instruments, data analysis, validity, reliability, trustworthiness and ethical considerations in order to answer the main research and sub-research questions and to reject or accept the hypotheses formulated in chapter 1 (Section 1.5.3).


Research methodology, as described by Welman et al. (2011:2), is the general research strategy that considers and explains the logic behind research methods and techniques. These methods, described in the research methodology, define the means or modes of data collection and eventual analysis strategy (how specific results that inform the research questions are to be calculated). In this study, the research methodology is viewed as a process and procedures used to undertake a research study from a worldview to the answering of research questions. The research methodology for this study is outlined  in Figure 3.1 on the next page.

Figure 3.1 illustrates how the various components of the research relate to as well as influence each other. The figure also presents the data collection tools that were used in this study. The research paradigm as the first component of the research process is discussed below.

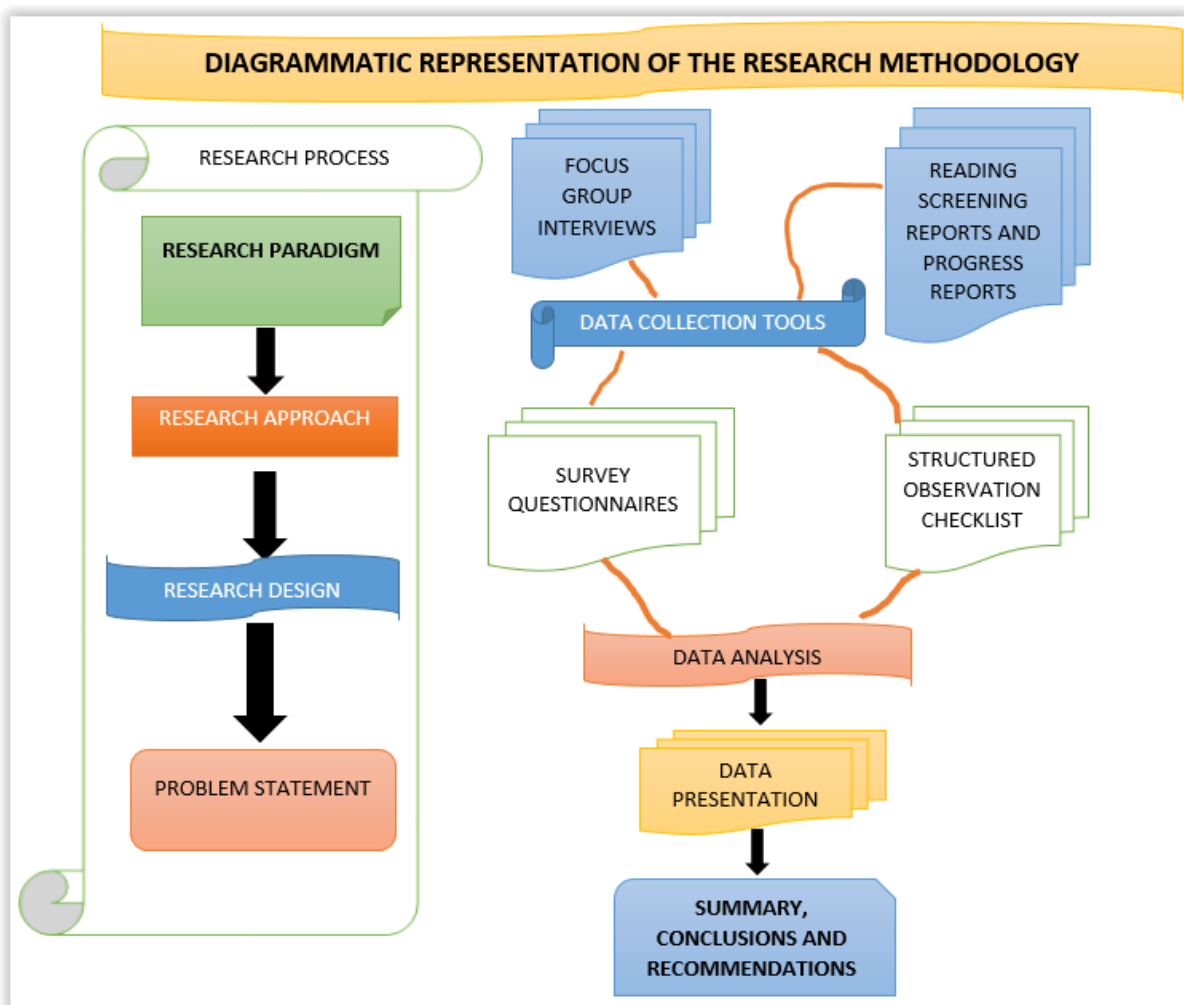


Figure 3.1: Diagrammatic representation of the research methodology

3.2 RESEARCH PARADIGM

Paradigm is a term that received attention in the 20th century after being identified by the American physicist and philosopher, Thomas Kuhn (1922-1966) as a fundamental principles, basic concepts and experimental practices of a scientific discipline. Babbie (2010:33) describes paradigm as a model or a frame of reference through which to observe and understand the research study. Creswell (2009:6) offers a broader perspective by stating that paradigm can be a philosophical worldview. This study shares Creswell's view, and therefore a paradigm is defined as a framework of beliefs, values and methods within which research takes place.

It was stated in chapter 1 (Section 1.7.1) that, the suitable paradigm for this study is constructivism. As explained in chapter 1, the constructivism paradigm is a broadly perceived concept that has many definitions. Guba and Lincoln (1994:110) define

constructivism in terms of the following philosophies, namely: ontology, epistemology and hermeneutics. Defining the constructivism paradigm in terms of ontology, Guba and Lincoln (1994:110) explain that it is the realities that are apprehendable in the form of multiple, intangible mental constructions, socially and experientially. They further posit that the elements of the ontological constructivism paradigm are often shared among individuals and even across cultures. Matuszek (2015:204) asserts that the ontology of the constructivism paradigm is an active construction of reality by a researcher, not a passive reception of what is directly given.

According to Guba and Lincoln (1994:111), it is difficult to distinguish between the ontological and epistemological constructivism paradigm. They define the epistemological constructivism paradigm as a transactional object of investigation, which can be interactively linked so that the findings are literally created as the investigation proceeds. Boghossian (2012:73) asserts that:

As an epistemology, the constructivism paradigm rejects the traditional or classical view of knowledge as 'Justified True Belief'. This view of knowledge, which can be traced back to Plato's Theaetetus, states that one can only claim to know something if it is true, if one believes it to be true, and if one has justification for the belief.

Hermeneutically, the constructivist paradigm, according to Domenici (2008:25), can be linked with social constructivism (Section 1.7.1). The link corroborates that the individuals' constructions can be elicited or refined through interactions with peers or adults and be regarded as social constructions. Peck and Mummery (2017:388) describe the hermeneutic constructivism paradigm as an approach to redress some limitations within many qualitative frameworks and open up an opportunity for a deeper and more nuanced understanding of the human being within a given set of circumstances.

The most suitable definition relating to this study is the ontological definition because, with ICTs, learners learn through experiential and social involvement. It links well with the main theory that forms part of the theoretical framework underpinning this study which is Vygotsky's sociocultural theory. Jaworski (2015:171) also confirms the fact that the constructivism paradigm elements can be shared across the cultures.

Table 1.2 provides a rationale for the selection of the constructivism paradigm as the appropriate paradigm for this study. The table indicates that although constructivism is predominant in qualitative methods, quantitative methods may also be utilised. The data collection methods shown in Table 1.2 also link perfectly with the data collection methods used in this study.

3.3 RESEARCH APPROACH

Research approach and research method are concepts that are generally used interchangeably. For the purpose of this study the concept 'research approach' was used throughout. Research approach can be defined as a strategy of enquiry, which moves from the underlying assumptions to research design and data collection (Myers, 2013:19-32). It has conclusively been shown by research that, the most important aspect of the research approach is the forms of data collection. However, Durrheim (2010:47) defines the research approach as a decision that is made after considering the purpose of the research and the types of data that will achieve that purpose. He adds that, in that decision, implications for consequences relating to sampling and data analysis should be considered.

Welman et al. (2010:3) and Creswell (2014:3) concur with Durrheim's definition that the research approach is a plan and the procedures for research that span the steps from paradigm to the detailing of methods of data collection, analysis and interpretation. Guided by the definitions above, the research approach in this study was viewed as the decision that guides how the research will be conducted, considering the topic and the main aim of the study.

It was indicated in chapter 1 (section 1.7.1) that the mixed-methods approach was selected as the most suitable approach for this study. Creswell and Plano Clark (2007:10) emphasise that mixed methods add a certain value to research, which qualitative or quantitative approaches, separately, do not provide. The definition of the mixed-methods approach presented by Creswell (2014:3) is that it resides in the middle of the research continuum because it integrates elements of both qualitative and quantitative approaches.

In addition, Creswell and Plano Clark (2007:12) define mixed methods as a separate methodology in which both qualitative and quantitative approaches, methods and procedures are combined or mixed to come up with a more complete picture of the

research problem. Delpont and Fouché (2011:434) support the fact that the mixed-methods approach is a separate methodology for conducting research that involves collecting, analysing, and integrating (or mixing) quantitative and qualitative research (and data) in a single study or a longitudinal program of inquiry.

The mixed-methods approach was selected as it allows for a combination of statistics and narratives to provide a better understanding of a research problem, integrating the findings at one or several points within the study (Delpont & Fouché, 2011:434). According to Terrel (2012:254), similar to other research approaches, the mixed methods approach has a variety of designs which provide specific direction for procedures in the research approach. The research design for this study is discussed below.

3.4 RESEARCH DESIGN

Research design is referred to as an integrated statement of and justification for the technical decision involved in planning a research project (Fouché, Delpont & De Vos, 2011:142). Babbie (2007:112) states that a research design involves a set of decisions regarding a specific topic that has to be studied, targeting a specific population, with a specific research approach and a specific purpose.

Nieuwenhuis (2011c:71) posits that a research design is a plan or strategy which moves from the underlying paradigm to specifying the selection of participants, the data collection methods to be used and the data analysis to be done. A similar view is held by Durrheim (2010:34) who defines a research design as a bridge between research questions and the execution or implementation of the study. He adds that it is a plan that guides the arrangement of conditions for collection and analysis of data. Guided by the above definitions, in this study, the research design was viewed as a strategy of inquiry within the research approach that guided the researcher throughout the study.

In chapter 1 (section 1.7.3), it was indicated that the research design for this study is concurrent triangulation mixed-methods design. The reason for the selection of concurrent triangulation mixed methods design is that both quantitative and qualitative methods were used to collect data to bring together the strengths of both research approaches and to corroborate the results.

The concurrent triangulation mixed methods design, according to Ivankova, Creswell, and Plano Clark (2011:268), is most suitable when a researcher wants to collect both types of data at the same time about a single phenomenon in order to compare and contrast the different findings to produce well-validated conclusions. Similarly, Cohen and Manion (2002:19) view the concurrent triangulation mixed-methods design as an attempt to map out or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint.

The quantitative data was used to assess the effectiveness of the use of ICTs in supporting learners experiencing reading difficulties while the qualitative data collected from the same participants explored their experiences when supporting the learners.

3.5 POPULATION

There is consensus among social scientists that a population may consist of elements, individuals, or units. Welman et al. (2011:52) define population as the study objects, which consist of individuals, groups, organisations, human products and events, or the conditions to which they are exposed. In addition, Strydom (2011:223) defines population as individuals in the universe who possess specific characteristics.

On the other hand, Durrheim and Painter (2010:132) define population as the larger pool from which sampling elements are drawn and to which findings can be generalised. Similarly, Strydom (2011:223) points out that population are a term that sets boundaries on the study. Drawing from these definitions, population, for this study, means a total group of participants that make a unit of analysis from which the researcher wishes to make specific conclusions.

Guided by the definition, the population for this study comprised of teachers who are members of the SBST and LSEs because I aimed to explore, describe and explain their experiences and perceptions from supporting learners experiencing reading difficulties using ICTs. As per the definition of population above, it can be seen that participants needed to be sampled for feasibility purposes.

3.6 SAMPLING

Traditionally, it has been argued that it is usually impossible to include the entire population in the study, the two main restrictions being time and cost (Maree &

Pietersen, 2011:172). Welman et al. (2011:55) state that it is impractical and uneconomical to involve all the members of the population in a research project.

A sample, according to Strydom (2011:223), comprises elements or a subset of the population considered for actual inclusion in the study. Lindegger (2011:468) describes a sample as any subjects who are available to participate in a study. Brink (1996:133) shares a similar view and defines a sample as a subset of a population selected to participate in the study. While a variety of definitions of the term sample have been suggested, this study used the definition first suggested by Brink (1996) who considers a sample as a selected subset of a population.

Sampling is defined as a selection of research participants from an entire population and involves decisions about people, settings, events, behaviours and/or social behaviours (Durrheim, 2011:49). Mphahlele (2013:50) interprets sampling as a process of selecting a group of participants who represent the target population.

For this study, sampling meant the process of taking a representative selection of the population of interest so that the results can be fairly generalised. In Section 1.7.4.1, it was explained that sampling for this study, concurrent mixed methods sampling was employed. Teddlie and Yu (2007:85-89) put forward that concurrent mixed-methods sampling strategies may employ all the probability and purposive techniques in order to generate complementary databases that include information that has both depth and breadth regarding the phenomenon under study.

The concurrent mixed-methods sampling resonated with the design of this study (concurrent triangulation mixed methods design) because it allows the researchers to triangulate the results from the separate quantitative and qualitative components of their research, thereby allowing them to confirm, cross-validate, or corroborate findings within a single study (Creswell, Plano Clark, Gutmann, & Hanson 2003:229). Table 3.1 illustrates the characteristics of concurrent mixed methods sampling.

Table 3.1: Characteristics of concurrent mixed methods sampling

Dimension of contrast	Concurrent mixed methods Sampling
Overall purpose of sampling	Designed to generate a sample that will address research questions.
Issue of generalisability	For some strands of a research design, there is a focus on external validity issues. For other strands, the focus is on transferability issues.
Sampling techniques	Uses techniques employed by both probability and purposive sampling.
Rationale for selecting cases/units	For some strands of a research design, there is a focus on representativeness. For other strands, the focus is on seeking out information-rich cases.
Sample size	There are multiple samples in the study. Samples vary in size dependent on the research strand and question from a small number of cases to a large number of units of analysis.
When the sample is selected	Most sampling decisions are made before the study starts, but QUAL-oriented questions may lead to the emergence of other samples during the study.
How selection is made	There is a focus on expert judgment across the sampling decisions, especially because they interrelate with one another. Some QUAN-oriented strands may require application of mathematical sampling formulae.
Sampling frame	Both formal and informal frames are used.
Form of data generated	Both numeric and narrative data are typically generated. Occasionally, mixed methods sampling strategies may yield only narrative or only numeric data.

Adapted from Teddlie and Yu (2007:86)

It can be seen from the data in Table 3.1, that concurrent mixed-methods sampling uses techniques employed in both probability and purposive sampling in order to generate both numeric and narrative data. Guided by the information on Table 3.1 above, both purposive and probability techniques were used to generate data for both the quantitative and qualitative strands. Only the SBST members required sampling because their numbers varied according to the sizes of the schools. The LSEs in the FSS were mostly not more than two.

I requested the selected FSS to send me the list of all the SBST members with a description of their roles. The list is attached as Appendix A (with real names replaced with pseudonyms). The reason for this request was that SBSTs comprise of members who play different roles in the team. For example, there are representatives from other committees such as sports, assessment, admission and bereavement. The SBSTs comprise of members from a variety of backgrounds in order to provide the learners

with holistic support. The list included all the members of SBST including those who support learners experiencing reading difficulties.

First, probability sampling was used to select the participants from the given list who mostly support learners experiencing reading difficulties. All the individuals in the overall sample were SBST members, which gave the sample a homogeneous status. Lastly, due to a much smaller number of SBST members and LSEs, the purposive sampling technique known as complete collection (criterion sampling) was used. In this technique, all SBSTs who support learners experiencing reading difficulties were selected from the list (Appendix A) by using a coloured pen. After the selection, in some FSS, the numbers were more than required so simple random sampling was used to bring the number to 40 SBST members. The final sample is attached as Appendix B. Now that the participants are known, the section below outlines how data was collected from the participants.

3.7 DATA COLLECTION

Babbie (2013), Creswell (2014) and MacMillan and Schumacher (2010) define the data collection process without defining data itself. However, due to the nature of this mixed-methods study, it is essential to provide a definition of data. Data, according to Durrheim (2010:51), are the basically collected materials which, once analysed, assists in informing researchers on the research questions of the study. Creswell (2009:178-181) indicates that data may be collected from observations, journals, questionnaires, art, poetry, music, interviews, and other sources.

Data can take the form of numbers (numeric or quantitative) or narratives (qualitative). Data collection is defined by Creswell (2011:171) as gathering information to address the questions being asked in the study. Similarly, Tashakkori and Teddlie (2010:823-825) define data collection as the process that allows researchers to systematically collect information about objects of study (people, objects, phenomena) and about settings in which they occur. For this study, data collection can be defined as the process of obtaining information and opinions from the sampled participants using different data collection instruments. These, *inter alia*, included structured questionnaires, interviews, figures taken from reports, documents (assessed via content analysis).

Data collection for this study was informed by the paradigm (constructivism), research approach (mixed methods), research design (concurrent triangulation mixed-methods design) and the sampling technique (concurrent mixed-methods sampling). Consequently, quantitative and qualitative data were collected on the same topic concurrently (Creswell, 2008:34).

A structured questionnaire (Appendix C) and structured observation checklist (Appendix D) were used to determine the effectiveness of ICTs in supporting learners experiencing reading difficulties in the FSS. Focus group interviews and reading-screening reports, as well as progress reports (qualitative instruments), were used to explore, describe and explain the experiences of the participants (SBSTs and LSEs) when using ICTs to support learners experiencing reading difficulties. The quantitative and qualitative data were collected concurrently to bring together the strength of both methods of research in order to compare, validate and corroborate results. The data collection process for this study is illustrated in Figure 3.2 and discussed in detail underneath Figure 3.2.

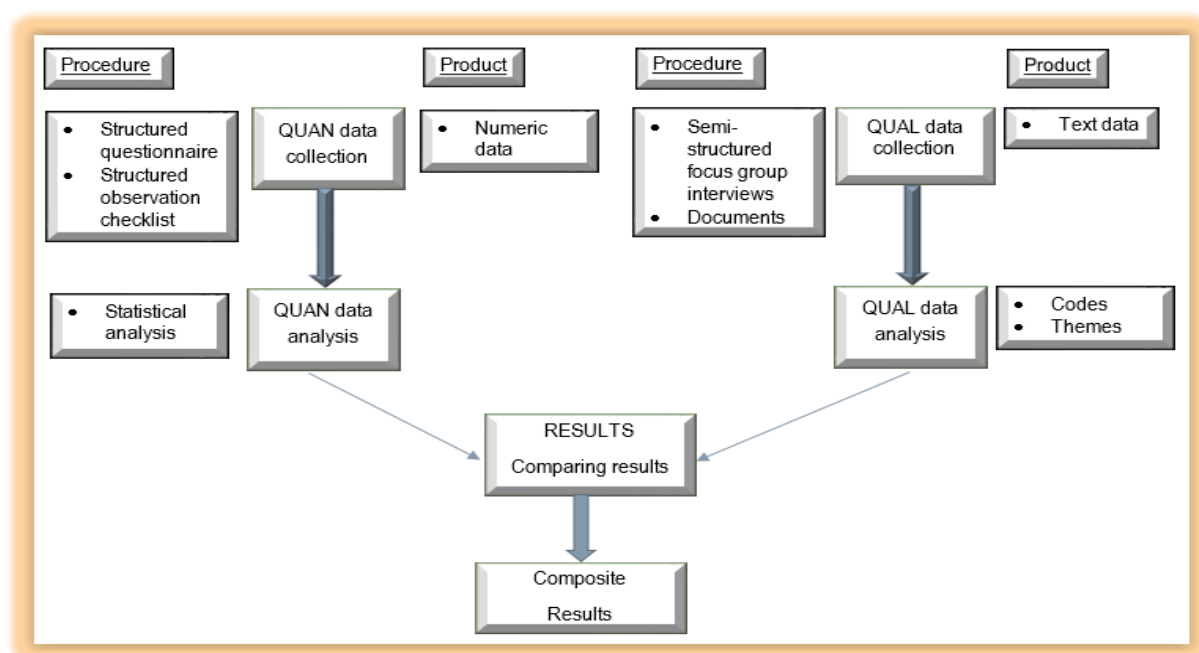


Figure 3.2: Concurrent triangulation data collection

Adapted from Creswell (2008:3)

Figure 3.2 illustrates that the quantitative and the qualitative data were collected concurrently using a structured questionnaire, structured observation checklist, focus

group interviews and official documents. The results of both quantitative and qualitative data were compared and integrated using concurrent triangulation mixed methods design. Each data collection tool is explained in detail below.

3.8 DATA COLLECTION TOOLS

It has been outlined in chapter 1 (Section 1.7.4.2 and through Table 1.3) that data for this study was collected using: a structured questionnaire, structured observation, focus group interviews, reading-screening reports and progress reports. Below is the detailed explanation of how each tool was used in this study.

3.8.1 Structured questionnaire

Firstly, I would like to clarify that when SBSTs and LSEs completed the questionnaire, they were referred to as respondents, not participants. They were only referred to as participants when they were participating in the focus group interviews.

A structured questionnaire is described by Welman et al. (2011:149) as a standardised measuring instrument used to collect data from a group of respondents to obtain the following type of information: biographical details (age, educational qualification), opinions or beliefs and attitudes. Guided by the definition above, the structured questionnaire is viewed as a tool that can be used to obtain perceptions of the respondents.

For the purpose of this study, a structured questionnaire (Appendix C) was used to collect the quantitative data, which was aimed at determining the effectiveness of the use of ICTs to support learners experiencing reading difficulties. The questionnaire was issued to the 50 respondents, namely: (40 SBST members and 10 LSEs) in the 5 FSS schools to complete.

3.8.1.1 Design of the structured questionnaire

The questionnaire was designed to assess teachers' experiences in using ICTs and teachers' perceptions of the effectiveness of ICTs. (A copy of the questionnaire is attached in Appendix C.). The questionnaire consists of 10 closed-ended biographical information questions (section A); 108 five-point Rickert rating scale questions - where the rating scale is either a five-point frequency-of-use scale, or a five-point learner-proportion scale - (section B); and three open-ended questions.

i) Section A - biographical information

This section probed participants' attributes of designation, gender, age, post level, qualifications, teaching experience, daily lesson periods, training attended, school area and the number of learners with reading difficulties that the teacher-participant teach/ assist. The purpose of the inclusion of these questions was to obtain some background on the research and the research respondents (the research context). This allows a description of the sample (reported in Chapter 5) and furthermore assists with the interpretation of analysis results within a specific research context (outlined in detail in the results interpretation in Chapter 5).

ii) Section B - perceptions

The 108 Rickert rating scale questions of section B are divided into 11 sub-groups of questions (each consisting of 10 questions, barring one group of 8 questions). These subsets of questions were designed to probe the aspects of factors that possibly contribute towards reading difficulties (10 questions); effect/ or implications of reading difficulties on learners (10 questions); trends/ or behavioural problems associated with reading difficulties (10 questions); learners reading skills / reading stage (10 questions); use of reading-screening tools, which include ICTs (10 questions); the availability of ICT technology/ devices/ applications (10 questions); frequency-of-use of ICTs to identify reading problems (8 questions); frequency-of-use of ICTs to support reading problems (10 questions); the effectiveness of ICTs in supporting learners reading problems (10 questions); Teachers training in ICT use (10 questions).

The 11 aspects probed in this section were included based on the key-aspects on reading difficulties and teachers' ICTs-utilisation experience identified in the literature review chapter (Chapter 2).

The following of the above listed aspects were designed to assess and describe the research background regarding learners with reading difficulties, namely:

- factors that possibly contribute towards reading difficulties (10 questions);
- effect/ or implications of reading difficulties on learners (10 questions);
- trends/ or behavioural problems associated with reading difficulties (10 questions);

- and learners reading skills / reading stage (10 questions).

An example question would be: *indicate the proportion of learners who would avoid learning activities.*

Likewise, the following of the above listed aspects were designed to answer to/ inform sub-research question 1 on '*teachers' ICTs-utilisation experience*', namely:

- use of reading-screening tools, which include ICTs (10 questions);
- the availability of ICT technology/ devices/ applications (10 questions);
- frequency-of-use of ICTs to identify reading difficulties (8 questions);
- frequency-of-use of ICTs to support reading difficulties (10 questions);
- and, teachers training in ICT use (10 questions).

An example question would be: *Indicate the frequency-of-use of ICTs usage for updating and reviewing ISP.*

The following above listed aspects were designed to answer to/ inform sub-research question 2 concerning '*teachers' perceptions of the effectiveness of ICTs in addressing reading difficulties*', namely: *the effectiveness of ICTs in supporting learners reading difficulties (10 questions).*

An example question would be: *Indicate the level of ICT effectiveness in relation to improving learners reading fluency.*

Respondents responses to these questions were either on a frequency-of-use scale (1=never; 2=seldom; 3=sometimes; 4=often; or 5= very regularly/ always); or on the proportion-of-learners scale (1=non/almost none; 2=small proportion; 3=approximately 50% of learners; 4=substantial proportion; 5 = great proportion/ all learners).

iii) Section C - open-ended questions

Three open-ended questions were included in this section to obtain more information on *challenges that teachers experience; training needs and pockets of excellence* that teachers experience when they support learners experiencing reading difficulties.

3.8.1.2 Administration of the structured questionnaire

The structured questionnaire was administered to 50 respondents (40 SBST members and 10 LSEs) at 5 identified FSS schools. The responses to the questionnaires were then electronically captured on an EXCEL spread sheet and analysed with the SAS (Statistical Analysis System) software package, version 9.2 (the software package SPSS was also used in some of the analyses).

3.8.2 Structured observation checklist

Table 1.3 in Section 1.7.4.2, points out that a structured observation checklist was used to collect quantitative data without any participants or respondents. A structured observation checklist is a quantitative data collection tool used in a structured setting also known as systematic observation. Collecting data using a structured observation checklist allows one to see what is happening without having to rely on what participants say or do. It is also good for descriptions (Tashakkori & Teddlie, 2003:313-315). Observational techniques such as the use of a recording sheet, observation guide or checklist are used without any input from respondents or participants (Kalpesh, 2013:1).

The structured observation checklist can be used with a fixed number of points to check, when applied in a predetermined number of situations, or with a predetermined number of people. This data collection tool is particularly useful when one wants to collect information about the extent to which particular phenomena occur, including information about the frequency whereby the observer records the presence or absence of items (Bentley, Boot, Gittelsohn & Stallings, 1994:5).

In this study, the structured observation checklist was used to collect quantitative data that was used to confirm the ICTs that are likely to be available in the schools.

3.8.2.1 Design of the structured observation checklist

The structured observation checklist was designed to check the availability and conditions of ICTs that are used in the FSS. A copy of the structured observation checklist is attached as Appendix D. It consists of the list of 8 different ICTs that can be used for teaching and learning activities at schools; the list of 8 different resources that can be used together with the ICTs; the second and third columns were designed

for indicating the availability of the listed ICTs and the resources; and the fourth which is the last column was designed for comments.

3.8.2.2 Administration of the structured observation checklist

The structured observation checklist was administered in the 5 FSS where I observed the availability of ICTs (by ticking the items on the checklist), recorded the quantity and described the condition of those available. The data collected from the structured observation checklist was correlated with the findings of the focus group interviews. For example, when participants mentioned the number of ICTs they had at the school, this was confirmed by the observation results. Sommer and Sommer (1997:45) advise that observation works better with the accompaniment of other procedures such as interviews which was the case in this study.

3.8.3 Focus group interviews

In the field of qualitative research, interviews are the most commonly used source of data (Kelly, 2010:297; Patton, 2002:34). An interview is defined as an interaction between the interviewer and the participant/s (Oltmann, 2016:8). In addition, Nieuwenhuis (2011c:87) defines interviews as a two-way conversation in which the researcher collects data and learns about the ideas, beliefs, views, opinions and behaviours of participants.

For this study, interviews were regarded as a more natural form of interaction with participants to understand the world from their point of view and to unfold the meaning of their experiences. As a result, I describe interviews as an interaction between people, which gives an opportunity to get to know them and understand how they think and feel.

Welman et al. (2011:165-167); Kelly (2010:303); Myers (2010: 123) and Creswell (2007:130) describe the basic types of interviews as individual one-on-one and focus group interviews. These types of interviews can be structured interviews, in which the interviewer is restricted to a predetermined set of questions; semi-structured interviews, which allow the interviewer to use probes with a view to clearing up vague responses; and unstructured interviews, when the interviewer might not have a predetermined list of questions but a general idea to explore.

This study employed semi-structured focus group interviews in order to gain a detailed picture of participants' beliefs, perceptions or accounts of the use of ICTs in supporting learners experiencing reading difficulties in the FSS. The focus group interview schedule is attached as Appendix E. Focus group interviews were conducted in order to enable participants to build on each other's ideas and comments so as to provide an in-depth view not attainable from other data collection methods (Nieuwenhuis, 2011c:90).

A focus group, according to Kelly (2010:304), is typically a group of people who share similar types of experience. Myers (2010:125) further states that the purpose of focus group interviews is to seek collective views on a defined topic of interest from a group of people who are known to have had relevant experiences. For this study, selected participants have relevant experiences in supporting learners experiencing reading difficulties.

The focus groups were conducted as follows: 10 groups from 5 FSS (2 groups per school) consisting of five participants made up of 4 SBST members and 1 LSE per school. With the help of the participants, suitable venues were identified which encouraged group interaction. The perceptions gathered through the focus group interviews were corroborated with the data that were collected from the official reports (reading-screening and progress reports) which are described below.

3.8.4 Official reports

The official reports (reading-screening reports, reading-progress reports and mark schedules) used in this study collected qualitative data and samples are attached as Appendix F. This study's constructivism paradigm allowed the researcher to use documentary sources such as letters, newspaper articles, official documents as they have an obviously 'constructed' nature and are a means by which ideas and discourses are circulated in the society (Kelly, 2010:316). Kelly further posits that for constructivism analysis, by contrast, a document carries a meaning independently of what its author's intentions were. "It is simply a point of intersection for social meanings (or discourse) and is no more distant from what really happened or what somebody really felt than an interview" (Kelly, 2010:316).

There should be a clear distinction between the literature review of a study and using documents as part of a data collection method because the two overlap, in the sense that they both deal with data sources in a written format (Nieuwenhuis, 2011c:82).

A literature review provides an overview of scholarship in a certain discipline through analysis of trends and debates while when using documents as a data collecting method, the focus should be on all types of written communication that may shed light on the phenomenon that is being studied (Nieuwenhuis, 2011c:82); Creswell, 2002:85). In addition, Nieuwenhuis advises researchers to adhere to criteria for selecting documents such as point of departure to determine if the document is primary¹⁹ or secondary²⁰; verify if it is based on empirical data (based on original research) or is anecdotal or opinion; check the purpose or intent of the document and consider the context in which it was produced; relate the document to your own study; and look at the methodology used in producing the document.

Given the types of documents and considering the criteria for selecting documents, for this study, only primary official documents (reading-screening reports, reading-progress reports and mark schedules) were used to collect data to explore, describe and explain the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties in improving levels of academic achievement in FSS.

3.9 DATA ANALYSIS

In chapter 1 (Section 1.7.4.3), the data analysis method for this study (mixed analysis) was described, and its procedures were explained. In this chapter, I present the steps recommended by Creswell (2011:203) that need to be followed in this process of mixed analysis to be able to respond to the research questions and the stated hypotheses. The steps include: *preparing data for analysis; exploring the data; analysing the data; presenting the data; interpreting the results; validating the data and results*. These steps are outlined in Table 3.2.

¹⁹ Primary documents are data that is original but unpublished (but it may also be in published form, like a letter in a newspaper or a company report) and which the researcher has collected from the participants or organisation directly (e.g. minutes of a meeting, reports, correspondence, etc).

²⁰ Secondary documents refer to any material (books, articles etc.) that are based on previously published work (Nieuwenhuis, 2011c: 85)

Table 3.2: Steps for data analysis

Step	Quantitative	Qualitative
- Preparing the data for analysis	<ul style="list-style-type: none"> - Converting the raw data into a form useful for data analysis. - Coding data by assigning numeric values. - Capture the data for SPSS. - Clean the data set. - Establish codebook. 	<ul style="list-style-type: none"> - Organise the audio data and documents - Transcribe the text - Upload the transcriptions into Atlas.ti program.
- Exploring the data	<ul style="list-style-type: none"> - Visually inspect the data - Conduct descriptive analyses - Check for trends and distributions. 	<ul style="list-style-type: none"> - Read through the data - Write memos - Develop qualitative codebook
- Analysing the data	<ul style="list-style-type: none"> - Choose an appropriate statistical test - Analyse the data to respond to the hypothesis - Report inferential tests, effect sizes and confidence intervals. 	<ul style="list-style-type: none"> - Code the data (Appendices are indicated and specified in chapter 4 of this study) - Assign labels to codes - Group codes into themes for categories - Interrelate themes (or categories) to sub-themes.
- Presenting the data analysis	<ul style="list-style-type: none"> - Provide results in tables and figures. 	<ul style="list-style-type: none"> - Present findings in discussions of themes - Present visual models, figures and/ or tables.
- Interpreting the results	<ul style="list-style-type: none"> - Explain how the results address the hypothesis - Compare the results with past literature, theories or prior explanations. 	<ul style="list-style-type: none"> - Assess how the research questions were answered. - Compare the findings with the literature. - Reflect on the personal meaning of the findings. - State new questions based on the findings.
- Validating the Data and results	<ul style="list-style-type: none"> - Validate and check the reliability of scores from past instrument use - Establish validity and reliability of current data - Assess the internal and external validity results. 	<ul style="list-style-type: none"> - Use validation strategies, such as member checking, triangulation, disconfirming evidence, and an external reviewer.

Adapted from Creswell (2011:203)

It can be seen from Table 3.2 that, from the first step (preparing the data for analysis) to the last step (validating the data results), actions are different, but the steps are concurrent. That confirms the fact that this study employed the concurrent triangulation mixed methods design. It should, however, be noted that the data analysis did not end at the sixth step in Table 3.2 because after validating both data strands (QUAN and QUAL),²¹ the results were compared as illustrated in Figure 3.2.

The process of comparing the data in the concurrent mixed methods data analysis is called merging (Creswell, 2011:223). In this process, the results from QUAN and QUAL data were merged to assess whether they were congruent or divergent. The results of the merge are discussed in chapter 4 of this study.

Creswell (2011), Mizrahi and Rosenthal (2001) and Tashakkori and Teddlie (2003) put forward three options for merged data analysis comparisons, namely: (1) Side-by-side comparison for merged data analysis which involves presenting both quantitative and qualitative findings together in a discussion or in a summary table; (2) A joint display, for example, a figure or table in which the researcher shows both quantitative and qualitative data so that the two sources of data can be directly compared; and (3) Data transformation merged analysis where one type of data is transformed into the other type so that both data types can be easily compared.

The merged data analysis comparison chosen for this study was side-by-side comparison because the data were analysed concurrently. However, the qualitative results are presented first followed by the quantitative results in chapter 4 of this study. This presentation was not informed by any rule; it was for ease of a logical flow. There are comments specifying how the qualitative quotes either confirm or disconfirm the quantitative results. Creswell (2011:224) advises that, regardless of whether there is congruency after the merge, the data has to be validated.

3.9.1 Analysis strategy

The analysis strategy planned for the mixed analysis of the data is comprehensively explained in Chapter 4 (especially in the case of the quantitative analysis). As explained in Chapter 4 the analysis strategy serves as a framework for the presentation of the analysis results in this chapter. Therefore, I argue that an analysis

²¹ QUAN and QUAL are abbreviations for quantitative and qualitative.

strategy is essential to ensure that the types of analyses conducted on the collected data will answer to/ inform the research questions of the study.

Briefly, for the qualitative data analysis the research strategy was to transcribe interviews, electronically import the text-transcriptions into the text analysis software programme Atlas.ti and identify themes that emerged from the text-transcriptions. This indicated to the research which themes recurred regularly in a discussion concerning learners with reading difficulties and the support of these learners – with specific focus on ICTs-utilization.

In a nutshell, the quantitative analysis strategy involved importing respondents' responses and learner reading-progress report figures (first term and second term reading scores) into the SAS system and analysing the data by means of the techniques of:

- i) frequency tables (one-way and composite one-way frequency tables) to assess how teacher perceptions were distributed with regard to the various aspects/themes probed. In this way, sub-research questions 1 and 2 could be informed and the research context described;
- ii) paired t-tests, which assessed whether learners' reading difficulties improved once they received support which include ICTs-intervention. This analysis further informed the results of (i) on the effectiveness of ICTs;
- iii) and two-factor analysis of variance (ANOVA) (using the general linear model approach: GLM). This technique assessed whether the reading skills of learners who did receive ICT-intervention were significantly more improved than learners who did not receive ICT-support. The ANOVA also investigated whether some of the identified FSS schools performed better after intervention than other FSS. In this way, sub research question 2 was addressed from another angle.

3.10 RELIABILITY, VALIDITY AND TRUSTWORTHINESS

Reliability and validity according to Nieuwenhuis (2011c:80) are crucial aspects of quantitative research while in qualitative research we usually refer to credibility and trustworthiness. McMillan and Schumacher (2013:331) comment, "Multiple disciplines broaden one's understanding of the method and the phenomenon of interest". In this regard, the qualitative method gives insight into the perspectives of respondents

regarding the use of ICTs in supporting learners experiencing reading difficulties. The quantitative method provides the numerical indices which correspond to the perspectives of the respondents (McMillan & Schumacher, 2009:139) and tests the hypotheses of the research study. Combining both the qualitative and quantitative methods “enhances the confidence in and reliability of research findings” (McMillan & Schumacher, 2010:139).

3.10.1 Reliability

Reliability means that scores received from participants are consistent and stable over time (Creswell, 2011:211). In addition, reliability can be defined as the extent to which a measuring instrument is repeatable and consistent. There are four types of reliability, namely: test-retest (administering same instrument to the same participants on two or more occasions); equivalent form (administering the instrument and then, on the second occasion, administer an equivalent instrument); split half (the items that make up the instrument are divided into two); and internal (number of items are formulated to measure a certain construct (Pietersen & Maree, 2011:215).

Reliability must furthermore be evaluated against the issues of applicability and relevance (Snelgar, 2010:99). McMillan and Schumacher (2014:113) and Onwuegbuzie and Johnson (2006:55) state that an analysis that reveals consistent results does not necessarily mean that it conforms to a theory or content or that it analyses what it set out to analyse. The above arguments indicate that reliability also touches on the field of validity; for example, verifying what the instrument purported to measure and if the results obtained are relevant to the aim of the study.

For this study, reliability was maximised through consistency in the administration of a structured questionnaire and structured observation checklist and ensuring the integrity of the data captured by cleaning and verifying it. Peer reviews were conducted in order to verify the dependability and consistency of the findings. In other words, findings reviewed by peers should remain consistent and therefore substantiate the accurate capture of the phenomenon under investigation (Tashakkori & Teddlie, 2003:694).

3.10.2 Validity

Validity is described as the extent to which the research findings accurately represent what is really happening in the situation (Welman et al. 2011:142). This study involved both QUAN and QUAL strands of data; consequently, there was a need to address the specific types of validity checks that were done for both strands (Creswell, 2011:239). Onwuegbuzie and Johnson (2006:56) and Teddlie and Tashakkori (2009:221) deem validity to be the best term for mixed methods because of its acceptance by both quantitative and qualitative research.

Validity in mixed-methods research is defined as the employment of strategies that address potential issues in data collection, data analysis, and the interpretations that might compromise the merging of the quantitative and qualitative strands of the study and the conclusions drawn from the combination (Creswell, 2011:239). Table 3.3 overleaf illustrates how validity was ensured in this study.

Table 3.3 illustrates how the data collection, analysis and interpretation were conducted with no or minimal validity threats. To ensure the validity of findings for this study, triangulation was done using the findings from the structured questionnaire, structured observation checklist, focus group interviews and official reports (reading-screening and progress reports) to clarify meaning, and verify repeatability of an observation or interpretation.

Table 3.3: Identified validity threats and strategies when merging data in concurrent triangulation mixed-methods research

Potential validity threats when merging data	Strategies used for minimising the threats
<i>Data collection issues</i>	
- Selecting inappropriate participants for both quantitative and qualitative data collection	- Drew quantitative and qualitative samples from the same population to make data comparable.
- Obtaining unequal samples sizes	- The same sample was used for both quantitative and qualitative data collection.
- Collecting two types of data that do not address the same topic	- Addressed the same topic (parallel) in both quantitative and qualitative data collection.
<i>Data analysis issues</i>	
- Using inadequate approaches to merge the data	- Side-by-side comparison for merged data analysis was used.
- Making illogical comparison of quantitative and qualitative analysis	- Found quotes that matched the statistical results.
- Using inappropriate statistics to analyse quantitised results.	- Examined the distribution of scores and considered the use of nonparametric statistics, if needed.
<i>Interpretation issues</i>	
- Not resolving divergent findings	- Used strategies such as gathering more data, re-analysing the current data, and evaluating the procedures.
- Not addressing the mixed methods research questions	- Addressed each mixed methods research question.
- Giving more weight to one form of data than the other	- Used procedures such as side-by-side comparison for merged data analysis to present both sets of results in an equal way.

Adapted from Creswell (2011:240)

3.10.3 Trustworthiness

Trustworthiness is based on determining whether the findings are accurate (Creswell, 2009:191). In addition, Nieuwenhuis (2011a:113) corroborates that trustworthiness is obtained through a process of testing the data analysis, findings and conclusions. In this study, I ensured trustworthiness by using multiple data sources (focus group interviews, structured observation checklist and official reports) to collect data and merging the findings for congruency.

Schurink, Fouché and De Vos (2011:420) established various strategies for increasing trustworthiness including triangulation, which they defined as the use of multiple

sources of data to corroborate, elaborate or illuminate the study. Triangulation in this study is evident due to the use of data collected from the various data sources which represent both qualitative and quantitative research approaches.

Apart from reliability, validity, credibility and trustworthiness of data and the results, there are ethical considerations for protection of the dignity of participants and the publication of the information in the research, which need to be considered. Hence, research cannot simply be conducted by anyone and anywhere (Maree, 2011:300).

3.11 ETHICAL CONSIDERATIONS

The concept “ethics” is rooted in the ancient Greek philosophical inquiry of moral life. Ethics are viewed as the branch of philosophy, which deals with dynamics of decision-making concerning what is right, and wrong (Fouka & Mantzourou, 2011:4). Snelgar (2015:165) opines that the choice of research design does not only require the selection of suitable participants and efficient data collection methods but the acknowledgement of and adherence to ethical criteria, which include: (1) protection of participants from harm; (2) voluntary and informed participation; (3) right to privacy and (4) researcher integrity and honesty.

To ensure that the ethical requirements for this study were met, application was made for ethical clearance from the UNISA Research Ethics Committee, and the approval letter was granted (Appendix G). Permission to conduct the research in the FSS was requested from the GDE, the District office and from the principals of the schools and the respondents. The approval letters are attached as Appendix G, H, I and J respectively.

Prior to data collection, an introductory meeting was requested, to disclose the purpose to the participants to avoid deception (Sarantakos, 2013: 89). The disclosure was in the form of a covering letter (Appendix K). This helped to gain trust and support of the participants. I did not pressurise participants into signing the consent forms (Appendix L) and the parents signing the consent on behalf of their children (Appendix L). I explained in the consent form that participants could decide not to participate in the study. The informed consent form, according to Creswell (2014:96), contains a standard set of elements that acknowledges protection of human rights.

I made sure that collecting and disclosing harmful information was avoided in all respects, that is, the privacy of the participants was respected. Anonymity was ensured by allocating code names such as School A, focus group 1, Teacher 1 and LSE 1. In addition to the above applications, participants voluntarily signed the informed consent form (Appendix L) before they provided data.

The sites, which were used for data collection, were selected without any vested interest. During the focus group interviews, clear straightforward, appropriate language was used (Creswell, 2014:100). It was agreed that language or words that were biased against persons because of gender, sexual orientation, racial or ethnic group, disability or age were not allowed.

3.12 CHAPTER SUMMARY

This chapter described how this study was conducted, with the focus on the research paradigm, research approach, research design, target population and sample, data collection methods and analysis. An outline of the study was provided in relation to the aspects of reliability, validity, credibility and trustworthiness linking them with the ethical considerations. In Chapter 4, a detailed discussion of the results, findings and deductions that could be derived from the analyses, are presented.

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

“There comes a time when you have to choose between turning the page and closing the book”

(Jameson, 2013: 1)

4.1 INTRODUCTION

The previous chapter (chapter 3) delineated and validated the research methodology and design of this study, purpose, aims, objectives and research questions including data collection applied to this study. Chapter 4, guided by the research design and underpinned by the theoretical framework outlined in chapter 2, presents the data analysis of the qualitative (QUAL) and quantitative (QUAN) strands of the concurrent triangulation mixed methods design denoted in the research process.

As indicated in chapter 3, this study employed mixed methods analysis. As a matter of importance, it should be noted that in the triangulation mixed methods design, both strands – QUAL and QUAN – as also outlined in chapter 3, are essential to the research and are analysed concurrently. As explained in chapter 3, the use of mixed methods for this study was to bring together the strength of both approaches to enrich, compare, validate and corroborate results. However, I decided to firstly present qualitative results for logical flow as also explained in section 3.9.

The reader is reminded, that, as indicated in the methodology discussion (Chapter 3), the development of an analysis strategy for this research was based on the main research question and sub-questions of the study: it was essential to collect data and to analyse the collected data in such a way that it would inform the research/ sub-research question/s. To recap, the main research question and sub-questions ask:

What role do ICTs play in supporting learners experiencing reading difficulties in the selected FSS?

With the sub-research questions that ask:

- What are the experiences of SBST members and LSEs regarding the use of ICTs in supporting learners experiencing reading difficulties in FSS?
- How effective is the use of ICTs in FSS in supporting learners experiencing reading difficulties as compared to other support mechanisms?

- What guidelines can be developed for ICT learner support for learners experiencing reading difficulties in FSS?

The sub-questions of concern when it comes to data collection and analyses are the first two questions. The results presented in this chapter indicate how the analyses of responses to specific sections of the structured questionnaire, reading-screening reports, performance reports and interview schedule informed the two sub-questions and therefore the main research question.

This chapter begins by describing how both the collected QUAL and QUAN data were prepared for analysis. The chapter then reports how data was analysed using Atlas.ti for the QUAL data analysis and both SPSS and SAS version 9.2 for the QUAN data analysis. The chapter then discusses the merging of QUAL and QUAN findings to assess whether results of the two approaches complement (and enrich) or contradict one another. Lastly, the findings are compared against the literature and theoretical framework, while at the same time reflecting on my personal interpretation.

4.2 DATA PREPARATION

The data from both strands were prepared as follows: QUAL audio data was given to the professional transcriber to transcribe while the QUAN raw data was captured to an EXCEL spreadsheet and submitted to a statistician to verify data integrity. The QUAL transcripts (Appendix L) were uploaded onto Atlas-ti to develop codes, quotations and memos in a process to identify themes from the transcribed text data (Appendix M) while the QUAN EXCEL spreadsheet was used to conduct statistical analyses using the statistical package SAS (and to a lesser extent SPSS) (Appendix N)

To protect the anonymity of the research respondents – as indicated in section 3.7, SBST members and LSEs who participated in the research were given pseudonyms such as ‘TA – TJ’ for each member of the focus group (Appendix B). The same protocol was adhered to in the presentation of analysis results which follows in this chapter.

Data from reading-screening reports and academic progress reports were prepared as follows: As indicated in Chapter 1, for each FSS in the Gauteng Province a minimum of 2 LSEs are allocated per school. These LSE each support a maximum of 12 learners per lesson session. These LSEs were therefore able to provide feedback

on 120 Grade 4-6 learners' reading progress. The reports (intermediate phase, 2 sets of reports) were received from the LSEs for the five schools.

The first set of reports identified learners and provided learners' reading status for the first term. Support was not yet implemented at this stage. At these FSS schools, only one computer-laboratory per school was available. Therefore, LSEs had to take turns in supporting learners by means of ICTs in the laboratory. An LSE uses a laboratory for a term and rotates with another LSE for the following term. In this process, only 50% of the learners receive reading support during the second term at school. An additional reason for the term-by-term use of the laboratory is that FSSs do not want to rely solely on ICTs as a support mechanism, they also use more conventional reading-support mechanisms. They want the learners that experience reading difficulties to be exposed to other support mechanisms as well.

The second set of reading-progress reports was received at the end of the second term, once some (50%) of the learners had received ICT support. For ethical reasons, the names of learners in the reports were replaced by numeric pseudonyms (Learner 1-120) to adhere to the confidentiality clause of the research. As was pointed out in the introduction to this chapter, the analysis discussion in this chapter starts off with the QUAL component of the data. Samples of the reading-screening reports, reading-progress reports and academic reports are attached as Appendix F.

4.3 ANALYSIS AND PRESENTATION OF QUALITATIVE DATA

As previously stated in chapter 3, QUAL data was gathered by means of focus group interviews as well as from learners' reading-screening reports, reading-progress reports and academic progress reports. Although the selected FSSs have a certain common background, each school also has its own unique context. This uniqueness is firstly illustrated in a description of the research participants.

4.3.1 Description of QUAL-Component Participants

Although the progress reports²² and reading-screening reports provided data on learner's reading ability and performance, the research participants for the focus group

²² The progress-report data was used in both qualitative and quantitative analyses.

interviews were LSEs and SBST members from 5 FSSs. A summary of the characteristics of the teacher-participants per FSS is presented in Table 4.1.

Table 4.1: Description of the participants

School	Location	No LSEs	No SBST members	Gender		Total Participants
				Male	Female	
A	Township	2	6	2	6	8
B	Informal Settlement	2	8	0	10	10
C	Informal Settlement	2	8	4	6	10
D	Township	1	9	1	9	10
E	Township	2	8	0	10	10
Total		9	39			48*
* In the quantitative analyses that follow in the next section, only 47 observations were recorded since one participant withdrew from the quantitative component of the study						

All five FSSs are located in Tshwane Municipality and their nearest city is Pretoria. As illustrated in Table 4.1, two of the FSS are situated in informal settlements²³ while three are situated in townships²⁴. Figure 4.1 depicts the distances between the various schools and Pretoria city centre.

²³ Informal Settlement according to the South African Housing Development Agency is an unplanned settlement on land which has not been surveyed or proclaimed as residential, consisting mainly of informal dwellings/shacks (The Housing Development Agency, 2012:53).

²⁴ Township in South Africa, usually refers to the often, underdeveloped segregated urban areas that, from the late 19th century until the end of apartheid, were reserved for non-whites, namely Indians, Africans and Coloureds (Pernegger & Godehart, 2007:6).

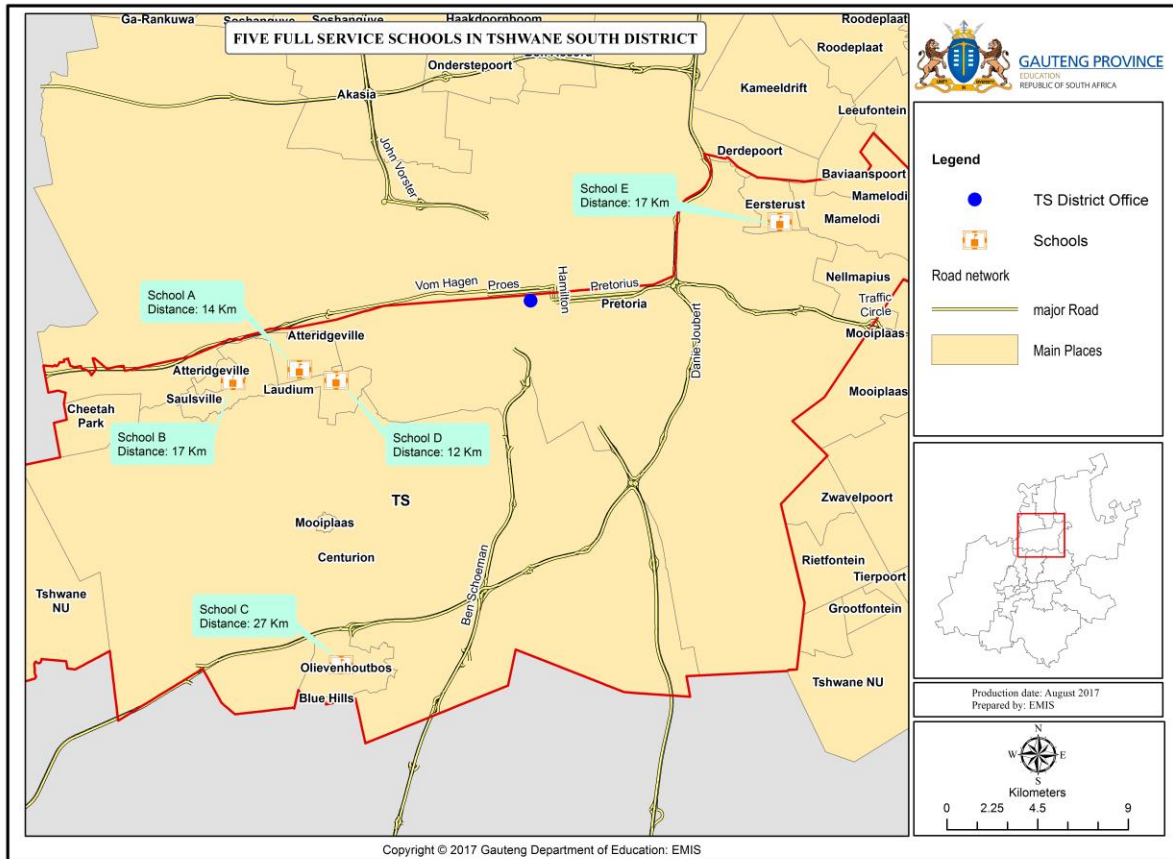


Figure 4.1: Five FSS of Tshwane South District

Source: GDE (2017)

As shown in Figure 4.1, only one FSS is more than 20km from Pretoria central and one of two schools is situated in an informal settlement. Even though School B is not that far from the city centre, it is situated in an informal settlement. The FSSs as presented on the map are not in close proximity to one another. The reason for their locality is that they provide support to other ordinary schools in their direct environment (Section 1.1.2). Most of the learners from the informal settlements experience lack of basic services (such as water and electricity) and most of their parents are unemployed and there is some over-crowding in their households. Despite the background of the learners, common to these FSSs is that, they are all equally resourced by the Gauteng Department of Education in order to support learners experiencing reading difficulties.

4.3.2 Data presentation

As mentioned in the introduction, Atlas.ti was used to code QUAL interview responses of participants. Atlas-ti analysis identified nine themes during the coding of the QUAL data. A summary table of the emerged themes is presented in Table 4.2.

Table 4.2: Summary of codes

Theme No	Emerging Themes	P1: School A	P2: School B	P3: School C	P4: School D	P5: School E	TOTAL
1	Utilisation of ICTs for supporting learners experiencing reading difficulties	5	1	5	5	6	22
2	Possible contributing factors towards reading difficulties.	19	6	13	4	9	51
3	Implications of reading difficulties	9	17	3	8	9	46
4	ICTs Guidelines	1	4	1	1	2	9
5	Identifying learners experiencing reading difficulties	5	0	4	4	5	18
6	Impact of the ICTs guidelines used for supporting learners experiencing reading difficulties	3	0	3	0	0	6
7	Effectiveness of ICTs in supporting learners experiencing reading difficulties	4	6	8	4	8	30
8	Supporting learners experiencing reading difficulties	19	7	7	3	17	53
9	Types of reading difficulties	7	12	8	5	28	60
TOTALS:		72	53	52	34	84	295

Table 4.2 indicates the number of codes that identified each theme per focus group and school. The actual codes per theme are reported in a table attached as Appendix O. In Table 4.2, the 'P' in column 3 to 7 indicates 'Primary Document'. Atlas.ti generates codes for text-documents as they are uploaded onto the system and names them 'Primary Documents' (in this instance, the text transcripts of interviews). For example, interview transcripts for School A were uploaded and labelled 'Primary Document 1' – indicated as P1 in Table 4.2 (Primary Document 1 for School A). The other interview transcripts were similarly labelled up to P5.

Column 3 to 7 of Table 4.2 indicate the primary document from each school's focus group interview, and the number of codes, per school, that contributed to the description/ or identification of the various themes when text was analysed by means of Atlas-ti. Column 8 indicates the total number of codes that describe each theme. The theme with the highest number of descriptive/ identifying code is "Types of Reading Difficulties" (60) followed by "Support Strategies" (53). "Importance of guidelines" and "guidelines" recorded the lowest number of codes which serves as an indication that participants are very aware of reading difficulties and aware of the fact that they need support strategies, but that their attention is not focused on the availability/ presence of guidelines in their FSSs.

Recent developments in data coding practices (text analysis) have identified the need to assess the reliability of such coding. Several researchers (Kolbe & Burnett, 1991:243; Mouter, 2012:3; Neuendorf, 2002:156) acknowledge intercoder reliability when manual coders are used instead of utilising text software such as Atlas-ti. These researchers argue that if a high level of interrater reliability can be established, a researcher can divide coding among different coders which will allow the coding process to proceed speedily and reliably.

According to Mouter (2012:3-4) to assess the reliability of the coding, at least two different researchers must code the same body of content. For this study, two researchers coded the transcripts and similar results presented in Table 4.2 emerged. The co-coded results are attached as Appendix P. Cohen's kappa coefficient was used to determine the intercoder reliabilities. According to Cohen's kappa coefficient, the levels of "intensity scale coding" are the following: (0) = no mention – the theme is not expressed in any way; (1) = suggested mention – suggestive of the theme; (2) = basic mention – a clear mention of that theme; and (3) = emphatic mention – a mention with strong emphasis or great intensity.

In Table 4.2, column 7, (which is the total number of mentions of each theme) it can be concluded that all the themes have strong emphasis or great intensity. Even though theme 6 (Importance of guidelines) was not mentioned by three focus groups, it still adds up to a total of 6 in column 7 which is significant.

This study set out to determine the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties in improving levels of

academic achievement in FSS. The relevance of this aim is clearly supported by the themes that emerged from the QUAL analysis. From the nine themes that emerged from the coded data, only seven themes were found to be most related to the objectives as set out in chapter 1 (section 1.6) of this study; therefore, the remaining two were merged with similar ones. For example, theme 4 (ICTs guidelines) as presented by Table 4.2 was merged with theme 6 (Impact of the ICTs guidelines used for supporting learners experiencing reading difficulties). That being the case, the themes that formed part of the QUAL data presentation of this chapter came to seven. To substantiate the data presented on the themes, other data collected from the official documents (Appendix F) were used. The relationship identified between the themes and the study objectives is summarised in Table 4.3.

Table 4.3: The study objectives linked to the emerged themes.

Objective	Emerging theme(s)
1. To explore the experiences of SBST and LSEs regarding the use of ICTs in supporting learners experiencing reading difficulties	1. Possible contributing factors towards reading difficulties. 2. Types of reading difficulties 3. Implications of reading difficulties.
2. To explore the effectiveness of ICTs against other support mechanisms currently being used in the FSS to support learners experiencing reading difficulties.	4. Supporting learners experiencing reading difficulties 5. Utilisation of ICTs for supporting learners experiencing reading difficulties 6. Effectiveness of ICTs in supporting learners experiencing reading difficulties.
3. To develop guidelines for using ICTs as a support mechanism for learners experiencing reading difficulties	7. Impact of the ICTs guidelines used for supporting learners experiencing reading difficulties

It appears from Table 4.3 that, that seven (out of the nine) selected themes that emerged from the QUAL analysis are grouped according to their relation to the objectives. As illustrated in Table 4.3, the first objective is linked with the first three emerging themes (Theme 1-3). The relationship between the objectives and the emerging themes came through their experiences of supporting learners experiencing reading difficulties, where the participants identified the possible contributing factors, different types and the implications of reading difficulties.

The link between the second objective and themes 4-6, emerged through the experiences of participants when using support mechanisms, including ICTs for

supporting learners experiencing reading difficulties, which provided a platform for comparison as to which support mechanism is effective. The last objective linked to the last theme (theme 7) which emerged from the views of participants regarding the implementation of ICTs guidelines when using ICTs for supporting learners experiencing reading difficulties.

Throughout the presentation of QUAL data there is a key for anonymity of the schools, participants and the names of the learners on the official documents (Appendix F). The key is presented in Table 4.4.

Table 4.4: Anonymity key

Description	Key
All 5 Full Service Schools	School A, B, C, D and E.
All Participants	TA, TB, TC, TD, TE, TF, TG, TH, TI and TJ
Learners Names on the official documents	L1, L2, L3 - L120.

4.3.2.1 Theme 1: Possible contributing factors

The findings from the focus group interviews regarding possible contributing factors make several contributions to the literature reviewed in chapter 2 of this study. First, the reviewed literature for this study from sources such as Gillet, Temple, Temple & Crawford, 2012 (428-451) revealed four possible contributing factors namely: intellectual, physical, language and learning factors. Drawing from the participants' responses, the factors indicated above became apparent and further generated addition social, cultural and socio-economic factors. *"I also think that social and cultural factors can contribute to this ... seeing that most of the parents are illiterate"* (TE: School A).

The mentioning of social and cultural factors resonates with one of the theories that form part of the theoretical framework underpinning this study, (Vygotsky's sociocultural theory) which was discussed in chapter 2 of this study, where it was indicated that Vygotsky (1978:90) pinpoints the importance of social learning in a culturally organised environment. The coding matrix was run using Atlas.ti and showcased the frequency of each contributing factor as mentioned by different participants in all five focus groups. The coding matrix is attached as Appendix Q.

Overall, socio-economic factors were identified as a major contributing factor towards reading difficulties. Participants mentioned socio-economic factors such as lack of parental support poverty (*“parents who do not afford basic reading material”* (TH: School F) *“...I think also hunger ...”* (TI: School C); lack of parents (orphans) *“...they come from squatter camps andthey are orphans...some child headed families”* (TB: School A); and lack of exposure to reading material, background *“...most of the learners here at school are coming from informal settlement”* (TF: School A) which limit the access and use of the library *“Our kids are not using the library”* (TD: School A).

TC from School A emphasised the factor of illiterate parents by saying *“I think the contributing factor is the illiterate parents, because once the parents are illiterate, for the little ones to be exposed to books, is through the inspiration from their parents, so they don’t have any other person who is inspiring them to open the books”*. Drawing from PIRLS (2011) report in relation to the socio-economic background as a contributing factor towards reading difficulties, learners from a poor background performed at 57% against 95% the national benchmark while learners in urban areas²⁵ performed at more than 80%.

The other factor which was found to be a possible contributing factor towards reading difficulties is absenteeism. Previous research, such as the study conducted by Kamal and Bener (2009), suggests that frequent absence from school, results in learners missing out important school work. Similarly, some participants in this study indicated that the majority of learners who experience reading difficulties happen to be those learners who frequently bunk classes and others absent themselves from school. *“... go for ten, fifteen minutes to the toilet until I go and look for her. ... Become absent from school two or three days in a week”* (TB: School E). *“I have an example the learner is in Grade 7.....he absents himself from school”* (TA: School A).

Documented evidence on the progress reports (Appendix F) of learners who experience reading difficulties in all 5 FSS, reveal the shocking high number of

²⁵ An urban area is the region surrounding a city. Most inhabitants of urban areas have non-agricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways.

absenteeism. Table 4.5 below illustrates the level of absenteeism of learners experiencing reading difficulties.

Table 4.5: Learners experiencing reading difficulties with high number of days absent in Term 1 (January - March)

School	Name	Age	Grade	Days Absent
School E	L97	15	5	35
School E	L98	12	4	10
School E	L103	14	6	14
School E	L100	10	4	14
School B	L28	12	6	12
School B	L48	12	5	12
School B	L29	14	5	10
School B	L43	11	4	9

As explained in the introduction and in Table 4.4, learners were allocated numerical pseudonyms from L1-L120. Table 4.5 illustrates learners from School B and E, the reason being that they were the only FSS among the 5 FSS with such a high rate of absenteeism. According to Table 4.5, the highest number of days absent is 35 which amount to 62% of the term school days. The problem is also evident in term 2 and the same FSS recorded a high rate of absenteeism. It seems likely that this absenteeism is contributing towards reading difficulties because these learners (Table 4.4) are not at the school most of the time when other learners are learning, including learning to read.

There could be several possible explanations for this learner absenteeism; however, for the purpose of this study, the reasons for the absenteeism were not explored. It has commonly been assumed that learners who chronically absent themselves from school might be due to bad grades, bullying, illness, and emotional issues as a result of socio-economic factors. Thus, it is possible that the absenteeism illustrated in Table 4.4 might be due to some of these causes.

Another possible contributing factor towards reading difficulties which was found to be most prevalent by the participants is language. Many recent studies such as Cockrum and Shanker (2013) have shown that a learner with language problems may present with reading difficulties. TF from School E pointed out that most of the learners in their school experience reading difficulties as a result of using English as a Home Language

(HL), while it is, in fact, their additional language. “....*in our school...English as Home Language.... Not familiar with pronunciation of the sounds...*” (TF: School E).

School D experienced similar issues as School E in relation to language as a contributing factor towards reading difficulties because they both admit learners from who speak African languages such as Sepedi, IsiZulu, SeTswana etc. and they use English as their HL and Afrikaans as First Additional Language(FAL): “... *because of the language barrier. ... They use Zulu, Sepedi. English to them is the new thing ... it is difficult for them to understand*” (TE: School D).

School A, B and C experienced a different challenge when it comes to language as a possible contributing factor towards reading difficulties. Learners from these three schools are using their mother tongues as HL; however, in school B, for example, they mentioned that most of their learners are doing *father tongue*. When TC from School B was requested to elaborate on ‘father tongue’ she indicated that most parents of these learners are involved in interracial marriages²⁶. As a result, fathers as dominant figures demanded that their children be taught in their languages. The problem that the participants emphasised was that even though fathers made such demands, they were less active in the education of their children. Mothers were the ones who support the learners in terms of completing homework and reading activities.

School A and C experienced similar challenges where the schools did not offer most of the learners’ mother tongue. For example, School C offers IsiZulu as HL and they have learners who are not IsiZulu speaking. “... *because at home they are speaking Xhosa, the school is IsiZulu...*” (TH: School C). School A offers Sepedi as HL while some of the learners are speaking SeTswana. However, these three schools are offering English as FAL and they also use it as the LOLT from Grade 4 to 7 as explained in chapter 1.

In view of all that has been presented so far, one may conclude that, there were quite several contributing factors that were mentioned by the participants; however, only those that were mentioned most frequently by most participants in all the focus groups were presented above. Some of the contributing factors that were mentioned only once or twice and not in all the focus groups include: a teacher as a barrier, “...*not*

²⁶ Interracial marriage is the term used to describe marriages that take place between people who are from different racial or ethnic groups.

preparing enough and not knowing our children better” (TD: School A). In addition, TJ from School C added that “...*most of the teachers when they are in teacher colleges or universities, they are taught how to teach the subjects, not necessarily how to teach learners how to read*”. The other factors mentioned were limited vocabulary, lack of motivation, heredity, poor phonics, lack of parental involvement and lack of discipline. Having presented various possible contributing factors towards reading difficulties, I will now move on to present the second theme that emerged namely types of reading difficulties.

4.3.2.2 Theme 2: Types of reading difficulties

As mentioned earlier there are different contributing factors towards reading difficulties and it can be argued that the different contributing factors can lead to different types of reading difficulties and presented in the QUAN analysis. From the 120 screening reports received from the 5 FSS and responses from the focus group interviews there were similarities with what the literature reviewed on chapter 2 from sources such as Moonsamy and Durbach (2016); Gunning (2010); Shanker & Cockrum (2009) and Table 2.1.

From the focus group interviews, the following types of reading difficulties were mentioned by participants: reading word-for-word, insertion, omission “...*sometimes they just read word by word, they insert their own letters, they omit the letter.*” (TE: School B). Drawing from the participants’ responses regarding types of reading difficulties, it became apparent that in all the 5 FSSs learners experienced similar types of reading difficulties which were also similar to those indicated in Table 2.1 in the literature review (section 2.3). For example, in Table 2.1, it is indicated that a learner with hearing difficulties might not recognise letters or words accurately, which might also be the case with the learners in school as mentioned by TE from School B.

Participants from School A, B and E emphasised their frustration regarding comprehension as the type of reading difficulties “... *they are very familiar with the words but they don’t understand what they are reading. ... they get high marks with reading fluently, but when you ask him questions, they don’t answer*” (TB: School E). Other types of reading difficulties mentioned by participants were spelling, poor word recognition, pronunciation, additions and decoding. These reading difficulties were presented in Table 2.1 as some of the causes of poor comprehension.

One of the more interesting responses came from TJ from School C “... *when you call them forward to come and read, then all that, it is like they listen to what the other has read and then when they come to you, they just go, they are saying whatever the previous learner said*”. The interesting part about this finding is that, the learner’s listening memory seems to be very good. However, the challenge is the visual memory to recall the words or sentences when reading. This finding also coincides with what the literature presented in Table 2.1 that, poor visual memory may result in learners’ poor reading.

The reading-screening reports (Appendix F) revealed the following as the most common types of reading difficulties experienced in the FSS: alphabetic principle, pronunciation, limited vocabulary, trouble making rhymes and poor spelling. From the responses of focus group interviews (and what was reflected on the reading-screening reports), it is clear that learners in the FSSs experience a number of reading difficulties most of which are captured on Table 2.1 in the literature review.

4.3.2.3 Theme 3: Implications of reading difficulties

With reference to the literature review, Jennings, Schudt, Caldwell and Lerner (2010:27-28) highlight a range of implications that can affect learners experiencing reading difficulties. Among others, underperformance, poor self-esteem and learner drop out were found to be most prevalent. Consistent with the literature review, participants in the focus group interviews reported the following possible implications of reading difficulties: behavioural problems, being withdrawn, absenteeism, little interest in school work, lack of self-confidence, lack of participation, incomplete written work, and aggressive behaviour, lack of concentration, frustration, dropout, underperformance and failure.

As much as absenteeism was reported earlier as one of the contributing factors to reading difficulties, it became evident from the focus group interviews that some of the learners decide to absent themselves from school because they felt out of place. “... *the learner is not participating in class all the time always absent from school, because he doesn’t enjoy the lessons* (TD: School A). A common view amongst the participants regarding implications of reading difficulties was that the majority of learners experiencing reading difficulties underperform academically. For example, TI from School B commented that “*They fail*”. She also emphasised that it mostly looks

like learners experiencing reading difficulties struggle to understand what is required on the question papers and consequently they fail.

When elaborating on this view, TA from School E revealed the most interesting finding by saying “... they *cannot complete tasks ... that causes poor marks, when they have poor marks, it affects their self-esteem and ... possibly they can drop out*”. The finding revealed by this quotation is that one implication of reading difficulties can lead to a chain of implications that affect learners negatively.

Turning now to the reading-progress reports which were received during the first term of the year revealing the identification of the 120 learners experiencing reading difficulties, it indicated the low rate of academic performance as illustrated by Table 4.6 below.

Table 4.6: Average Term 1 academic performance of 120 learners in 5 FSS

Average Term 1 Academic Performance of 120 Learners in 5 FSSs	
School	Term 1: 2017
A	32%
B	27%
C	45%
D	43%
E	47%

Source: Learners' academic reports

It should be noted that the results illustrated in Table 4.6 is for English First Additional Language (FAL) in School A, B and C while in school D and E they are for English Home Language. Table 4.6 above can be related to Figure 4.1, where a little background of the schools was given. However, caution should be exercised in considering the backgrounds of the schools because, by virtue of being FSSs, they are furnished with the same necessary resources. The main reason English was selected is that it is the Language of Learning and Teaching (LOLT) in most of the schools including the FSSs as indicated in chapter 1 of this study.

According to Department of Basic Education (2011:96-109,) in conjunction with the National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R–12, 7 levels of competence have been described for every subject. The various academic achievement levels and their corresponding percentage bands are illustrated in Table 4.7.

Table 4.7: Levels of academic achievement

Rating code	Description of Competence	Percentage
7	Outstanding achievement	80-100
6	Meritorious achievement	70-79
5	Substantial achievement	60-69
4	Adequate achievement	50-59
3	Moderate achievement	40-49
2	Elementary achievement	30-39
1	Not achieved	0-29

Source: (DBE, 2011:527)

The reason for showing these levels of achievement is to be able to link the performance of the 120 learners experiencing reading difficulties in the 5 FSSs to the policy requirements of the Department of Basic Education (DBE). As shown in Table 4.5, average performance of the 120 learners who are experiencing reading difficulties in the 5 FSS is below the adequate achievement level (50-59%). Table 4.6 shows that School C, D and E performed at the moderate achievement level during term 1; however, it should be noted that moderate achievement level (40-49%) is acceptable for FAL but not acceptable for HL. As mentioned above, School D and E are offering English HL, and it is noted that they underperformed because the acceptable level of performance for HL is adequate achievement (50-59%). In conclusion, only learners from 1 FSS (School C) out of the 5 FSS performed at an acceptable level during term 1.

Another implication of reading difficulties which was also regarded by the participants and as a serious cause for concern was learner dropout. Upon receiving the second batch of reading-progress and academic reports from the LSEs, I realised that reports for seven learners were missing. That was 5 from School B, 1 from School D and E respectively. A follow-up was done and the finding was that those learners had dropped out of school before the end of term 2. The finding coincides with the literature review (Section 2.4) and the findings from the focus group interviews as mentioned above.

It was noted in the literature review that there are other factors which may cause learner dropout. However, studies by Mwanamukubi (2013); Siqueira & Gurgel-Giannetti (2011) which included several countries, amongst others Kenya, Namibia, Swaziland, Malawi, Zambia and Mozambique found that the majority of learners who

dropped out of primary schools did not reach the minimum mastery in reading English. By minimum level it is referred to the SACMEQ reading levels which were explained in chapter 1 of this study (Section 1.2).

In terms of the dropouts' records of learners who were part of the sample for this study, Table 4.8 illustrates the details of the learners who dropped out during term 2 of 2017.

Table 4.8: Learners from the sample who dropped out of School in Term 2, 2017

School	Name	Age	Grade	Days Absent	Marks	Age vs Grade ²⁷	End of Term 2 - 2017
School B	Learner 25	14	5	3	5%	3 year(s) behind ²⁸	Drop out
School B	Learner 37	12	5	6	29%	1 year(s) behind	Drop out
School B	Learner 41	13	6	2	31%	1 year(s) behind	Drop out
School B	Learner 30	12	5	2	24%	1 year(s) behind	Drop out
School B	Learner 28	12	6	12	18%	on track	Drop out
School D	Learner 92	13	5	13	46%	2 year(s) behind	Drop out
School E	Learner 118	10	4	1	51%	on track	Drop out

Table 4.8 can be related with the trends from the literature review (section 2.4) that learners experiencing reading difficulties may feel embarrassed and devastated especially if they have to read with difficulty in front of peers and teachers, and to demonstrate this weakness on a daily basis (Lyon, 2007). From this data, we can see that Learner 118's marks are not as bad, and he/she was on track; however, he/she still dropped out of school. Other factors mentioned that may contribute towards learner dropout cannot be ruled out. For the purpose of this study, other factors such as poor socio-economic circumstances and inadequate support from teachers were all taken into consideration as they might have been the cause of reading difficulties and contributed to the dropout of these learners (Table 4.8).

²⁷ Age vs Grade means that the learner is behind with regards to Grade age, for example the learner in Grade 4 should be between chronological age 9 and 10 if such a learner is 11 years old, then the learner is 1 year behind.

²⁸ Behind means that, the learner is behind the standard due to chronological age as explained in age vs grade.

Learner dropout was also investigated by Hjorth, Bilgrav, Frandsen, Overgaard, Torp-Pedersen, Nielsen and Boggild (2016). Their findings revealed quite several possible causes which are applicable to this study as well, such as divorcing parents, conflict with peers and health issues. An important fact is that the study recorded 23% of dropouts being caused by school-related issues, including reading difficulties.

4.3.2.4 Theme 4: Supporting learners experiencing reading difficulties

When asked the question *“How do you support learners experiencing reading difficulties?”* in the focus group interviews, the participants started by sharing the challenges they experienced during the reading-support lessons. *“Most of them, will tell you, can I please go, I need to the toilet ... and each and every time they want to go to the toilet”* (TD: School A). A follow-up question was asked (*“What is it what makes them bored, don’t you think it might be the methodology that you are using?”*) based on the different challenges mentioned including the fact that these learners (experiencing reading difficulties) get bored during the reading-support lessons.

In response to the follow-up question, some of the participants blamed it on the limited resources and time they had to support learners experiencing reading difficulties. They indicated that they got to spend only about 45 minutes with the learners for the reading-support lessons and learners had to go back to their normal classrooms. However, they mentioned various teaching strategies and support mechanisms that they used which are displayed in Figure 4.2 in the form of a network created using Atlas.ti networks.

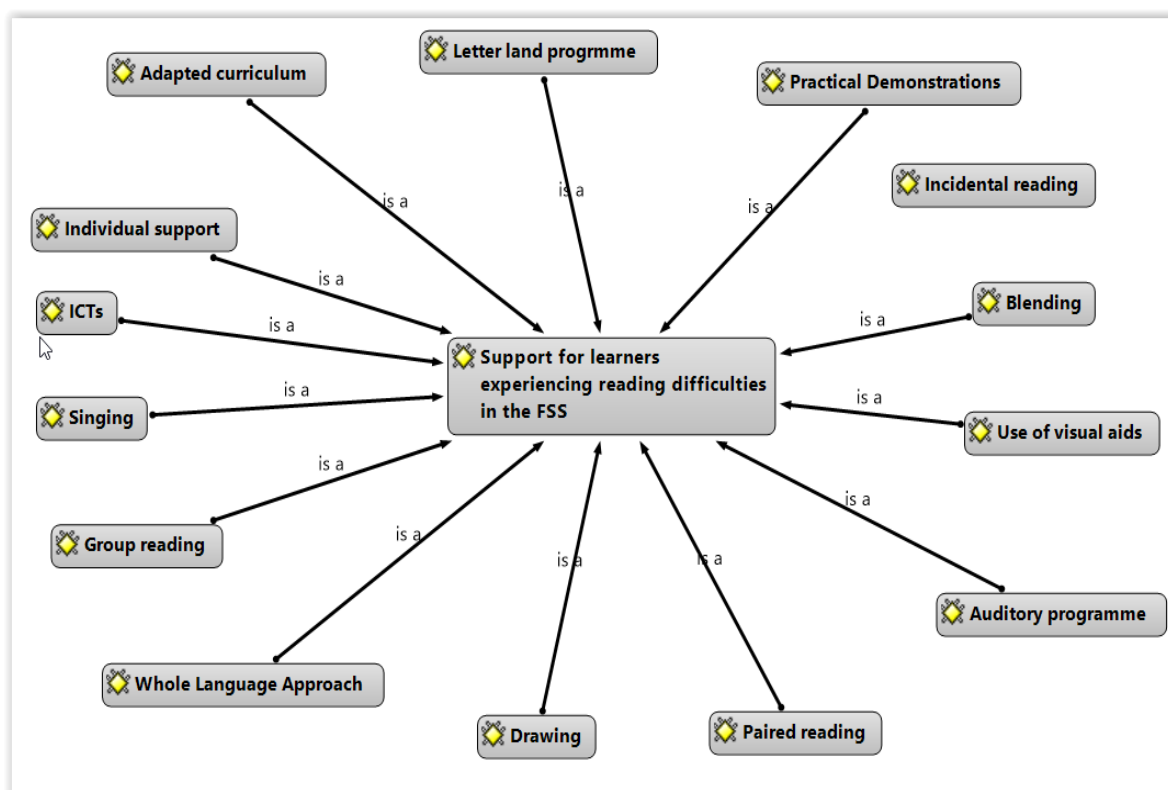


Figure 4.2: Network of teaching strategies and support mechanisms used in the five FSSs

As shown in Figure 4.2 learners experiencing reading difficulties in the FSS are supported with the teaching strategies and support mechanisms that include: adapted curriculum, Letter-Land programme, practical demonstrations, paired reading, peer reading, group reading, incidental reading, and auditory program; the use of visual aids, auditory programmes, drawing, the whole language approach and ICTs.

4.3.2.5 Theme 5: Utilisation of ICTs for supporting learners experiencing reading difficulties

The following ICTs were mentioned by the participants from the 5 FSSs as those that they use to support learners experiencing reading difficulties: *interactive smart boards, computers, data projectors, and laptops for teachers, tablets for learners, Televisions, radios, tape recorders, cell phones, DVDs and video players*. However, they mentioned the challenge of not having enough. “Every time when we want to use it, there’s someone who has also signed it out” (TE: School B).

When responding to the question: *Which ICTs do you find most effective?* Most participants in all five focus group interviews mentioned computers. TE of School B

highlighted that tape recorders are also frequently used “... *but most of the teachers are preferring tape recorders*”. Although some participants mentioned televisions and tape recorders as effective, computers were mentioned more frequently as the most effective. Some of the reasons given were “*Computers attract their concentration*” (TJ: School B). “*If it is a period for ICT, they will run, if you tell them, no today we not working, they will fight with me. They enjoy computer classes*”.

From the responses, it was evident that learners prefer ICTs to other support mechanisms. A follow-up question was asked to clarify why learners prefer computers and why teachers regard computers as the most effective ICTs to be used when supporting learners. TA from School B said “... *when a learner is inside of the computer, playing games, it speaks with them, they respond, they follow instructions, so I think that also helps a lot. It is like they think they are playing but in a way, they are learning*”.

TD also from School B also emphasised that “*computers communicate with learners through reading; as a result, they eventually acquire the reading skills through operating a computer*”. In School D, the participant shared the same sentiments as participants from School A, B and C and added that “*when in the computer lab learners become more interested and their participation is also enhanced*”. In School E, TF shared an experience of a learner who is physically disabled on the right-hand side due to polio, “.... *the learner prefers to learn using a computer especially when reading because he doesn't have to page through like in the book*”.

The responses of the participants, in general, indicate that ICTs in the FSSs are being utilised especially for supporting learners experiencing reading difficulties. As indicated above, because of the challenge of not having enough resources, most participants recommended that all classes should be equipped with ICTs so that they do not depend on the ICT lab only.

4.3.2.6 Theme 6: Effectiveness of ICTs in supporting learners experiencing reading difficulties

The participants indicated that the effectiveness of ICTs in supporting learners experiencing reading difficulties became apparent during the reading-support sessions which took place during term 2. As indicated in 4.2 above, the reading-support sessions (timetable attached as Appendix R) took place where one LSE used

ICTs to support a group of learners experiencing reading difficulties and the other LSEs did not. Each LSE had nine reading-support sessions per week with learners in the intermediate phase. The duration of a session was the same as the duration of the period (some were 30 minutes while some were 1 hour). The LSEs supported learners in a way that is called “pull out system”. With the “pull out system”, the learners identified to be needing the support were sent out of the class to the reading lab or computer lab to meet with the LSEs for the support sessions. At the end of the sessions, the learners went back to their respective classrooms to continue with other subjects.

The LSEs who did not use ICTs used different support mechanisms, some of which are indicated in Figure 4.2. Some indicated that they used programmes such as *“Letter-land, auditory programmes and incidental reading”*.

At the end of term 2 (reading support took place), reading-progress reports were submitted together with academic reports (Appendix F) of the 120 learners experiencing reading difficulties in the 5 FSSs. The reports were grouped according to learners who were supported with ICTs and those who were supported with other support mechanisms. The LSEs were requested to label the envelopes when submitting the reports so that it was clear as to which groups were supported with ICTs. The average academic performance of the groups of learners mentioned above is illustrated in Tables 4.9 and 4.10 respectively.

Table 4.9: Average academic performance of learners supported with ICTs

Average academic performance of 60 learners who were Supported with ICTs in 2017		
School	Term 1 (Pre-Support)	Term 2 (Post-Support)
A	34%	42%
B	26%	31%
C	44%	48%
D	42%	46%
E	44%	45%

Table 4.9 illustrates average academic performance of 60 learners who were supported with ICTs in the 5 FSS. It is evident from Table 4.9 that there had been some improvement with the highest increase of 8% in School A followed by 5% in school B. The academic improvement illustrated in Table 4.9 cannot be regarded as

significant because it did not move the highest performing FSS to the adequate level of achievement as per Table 4.7. It should be noted that, the ICT support took place within the period of 3 months which is term 2 of 2017.

Table 4.10: Average academic performance of learners not supported with ICTs

Average academic performance of 60 learners who were not supported with ICTs in 2017		
School	Term 1 (Pre-Support)	Term 2 (Post-Support)
A	37%	36%
B	28%	24%
C	45%	41%
D	45%	44%
E	50%	43%

Table 4.10 illustrates the average academic performance of 60 learners who were not supported by ICTs. It is apparent from this table that there is no academic improvement for all 5 FSS. Linking this finding with the comments made above in Theme 5 regarding the reasons why computers were regarded as the most effective ICTs, it can be concluded that the lack of improvement of this group of learners might be due to the comments also made under Theme 4 that learners get bored during the reading-support lessons. Comparing data from Table 4.9 with the data in Table 4.10, it can be seen that ICTs as support mechanism has the potential (although slight) to improve academic achievement.

The comments of participants under theme 5 with regard to the use of ICTs when supporting learners experiencing reading difficulties can be compared with the minimal improvement effected by the ICTs support in Table 4.9. Given the limited period (3 months) of the support, it is safe to conclude that given more time ICTs might produce a remarkable academic improvement of learners.

Most of the participants mentioned the following experiences regarding how they viewed the effectiveness of the use of ICTs:

- Attracts interaction among the learners;
- Learners become more interested in learning;
- Enhance participation;

- Makes learning fun;
- Improves listening skills because learners become attentive.
- Encouraged learning through play.

4.3.2.7 Theme 7: Impact of the ICT guidelines used for supporting learners experiencing reading difficulties

It was cited in the literature review (Section 2.6.5) that ICTs is a global policy constraint which was viewed as an important tool to achieve Education for All (EFA). That being the case, it necessitates guidelines for teachers when using ICTs in the schools. It is concerning that only a few participants declared to be having some ICTs guidelines in their schools. TH: School A indicated that the only guidelines they have serve as a policy for the access and usage of the computer lab. *“...but then was then only for the use of the computer lab”*. This could also be a reason why there is little improvement (Table 4.1).

In school B participants indicated that Gauteng Department of Education (GDE) provided them with ICT policy, which they used to formulate their own ICT guideline. *“... I mean the guidelines from the Department, we formulate our own policy”* (TG: School B). On the question about the impact of the guidelines when supporting learners experiencing reading difficulties, it was also noted from other participants in School B that the guidelines are, in fact, not utilised. *“Ja, so we do have the guidelines but unfortunately we never refer to the guidelines ever since”* (TJ: School B). As a result, its impact could not be indicated.

In School C, participants agreed that they have the guidelines but they could not elaborate on what impact the guidelines had on the use of the ICTs, especially when supporting learners experiencing reading difficulties. Participants in School D mentioned that they did not have any guidelines and indicated that since their ICTs were stolen they are hoping to develop one as soon as they get replacements. Lastly, in School E, participants indicated that it was an oversight from their managers that they did not have ICTs guidelines.

The analysis of qualitative data undertaken in this study, has confirmed the data in the literature review. As presented above, it is worth noting that participants are aware of the possible contributing factors towards reading difficulties and they are also able to

distinguish between the different types of reading difficulties. However, it was also recognised that the use of ICTs in the FSSs to support learners experiencing reading difficulties is limited to the LSEs (2 per FSS) who are only able to support a small group of learners within a given time. Referring back to the slight improvement illustrated in Table 4.1, it is safe to conclude that the limited use of ICTs by LSEs might also be the reason.

4.4 ANALYSIS AND PRESENTATION OF QUANTITATIVE DATA

It was stated in the introductory section of this chapter that the purpose of data collection and analysis is to inform/ answer to the two sub-research questions of the study which ask,

- (i) What are the **experiences** of SBST members and LSEs regarding the utilization of ICTs in supporting learners that experience reading difficulties in FSS? and,*
- (ii) **How effective is the use** of ICTs in FSS.s in supporting learners experiencing reading difficulties as compared to other support mechanisms?*

By answering to these questions, the main research question is addressed, namely: What role do ICTs play in supporting learners experiencing reading difficulties in the selected FSSs? A framework for the discussion of analysis results is presented in the next sub-section which explains how quantitative findings have been logically reported and interpreted. The discussion which then follows, not only answers to the research question/s, but also serves to clarify the research context. Knowledge of the research background enables the researcher to sensibly interpret his analysis findings.

Comments:

- i. It is again noted that the sample for the survey consisted of 47 respondents from 5 FSSs (9 LSEs and 39 SBSTs), as one LSE withdrew from the QUAN component of the study.
- ii. In the presentation of the quantitative results, the reader will observe that questionnaire variables (the various questionnaire questions) are labelled according to an alpha-numerical code. These codes were used to simplify statistical programming and data manipulation. All the codes start with QB and the

uniqueness of the code lies with the third letter and the numeral which specifies the section of the questionnaire and question number.

iii. The discussion on the quantitative tables are put above the tables.

4.4.1 Framework for results discussion

The framework for the discussion of the quantitative analysis results are presented in this section and lists the (questionnaire) variables that pertain to each section; the type of analyses performed and the purpose of a particular analysis. These sections are:

- i. a section of results that explains the research context;
- ii. a results section that answers to the question concerning teachers' experiences in the utilisation of ICTs to support learners experiencing reading difficulties; and
- iii. a results section that evaluates the effectiveness of ICTs in supporting learners' reading difficulties.

4.4.1.1 Frequency tables that describe the research context

Two aspects are addressed here, namely, the type of research participant and the type of reading difficulties learners experience.

- The research participants: the variables (questionnaire questions) analysed to describe the research context include participant responses as to their designation; gender; age; post level; qualifications; experience; number of lesson periods per week; workshop attendance and the location of the school. Information contained in these frequency tables presents a general picture of the research participants: the type of person that answered the research questionnaire. This interpretation is reported by means of composite frequency tables of participant-attributes.
- Background on reading difficulties: to describe the background of learners' reading difficulties, composite frequency tables that report the frequency-response patterns on the following themes contained in the questionnaire are presented: Topic A: factors that possibly contribute towards, and are associated with reading difficulties; Section B: perceived implications of reading difficulties; Section C: perceived trends that co-occur with reading difficulties; Section D: Learners reading ability (reading stage);

Knowledge of these issues highlights the problems and issues that learners and teachers deal with when it comes to reading difficulties and provides another angle in interpreting the more specific analysis results on the utilization of ICTs and the effectiveness of ICTs in supporting reading difficulties.

4.4.1.2 Respondents' experience of using ICTs

To describe/ inform the issue of respondents' experience using ICTs (sub-research question 1) to support learners experiencing reading difficulties, composite one-way frequency tables were used.

Questionnaire response patterns reported in this regard include:

- screening tools used
- availability of ICTs
- ICT use to ID learners experiencing reading difficulties
- ICT usage to support learners experiencing reading difficulties
- Training related to ICTs

In these tables, the last row of each table – the 'totals-row' – reports the total number of responses for all items listed for a particular theme (e.g. for the screening-tools-used theme, the level-response totals (never/ seldom; sometimes; often/ always) are tallied for the various tools such as informal inventories; norm reference tests; ... up to ICTs). The totals-row in each table serves to indicate whether participants – in general – made use of, say, support tools or not. If the proportion of responses to the often and very frequently categories are large in relation to the 'never' and seldom categories, the deduction can be made that, in general, participants do use, say, support tools.

Furthermore, in these tables, the proportions of positive (frequently/ very frequently) to negative responses (never/ seldom) for individual items of a specific theme serve as indicator of which items were selected more/ or less often. In this way, with regard to research question 1, the data can establish (i) which specific support tools are used most frequently; (ii) whether ICTs are (and which ICTs) are freely available to be used; (iii) whether ICTs are often used to identify reading difficulties (and which ICTs serve

this purpose); (iv) how often the various ICTs are used in supporting learners experiencing reading difficulties; and (iv) what the general and specific need for training is regarding ICTs. In this way research sub questioned 1 is answered.

The next subsection indicates which responses to questionnaire sections were used to inform sub research question 2, and the type of analyses used to extract the required information.

4.4.1.3 Questionnaire responses to specific questions and term 1 and term 2 reading progress reports

Composite one-way frequency tables, pre-post t-tests, and ANOVA are relevant. Two sets of data are analysed. Analyses include:

- A section that discusses the findings derived from a composite frequency table of participant responses to section I of the questionnaire, namely, 'The effectiveness of ICTs in addressing reading difficulties'.
- A discussion of the interpretation of the results of a pairwise (pre-post) t-test
- An ANOVA (GLM approach) on the performance figures drawn from the performance reports of learners prior to and after the use of ICTs to improve reading difficulties (Paired t-test: McDonald, 2014:180-185; ANOVA: McDonald, 2014:173-179; SAS: Spector, 2001:179-201)

Results inform sub-question 2 as follows:

The totals-row (last row) of the composite one-way frequency tables as well as the row-totals for each individual item under the 'effectiveness of ICTs in addressing reading difficulties'-theme provide the findings on the general perceived level of effectiveness which participants ascribe to this theme, as well as how effective the individual ICT items/ issues are perceived to be. The t-test on the pre-post performance figures (drawn from the performance reports) of the learners that did receive ICT support also serve to enhance the evaluation of perceived effectiveness of ICTs in supporting learners experiencing reading difficulties. The results of the ANOVA (McDonald, 2014:173-179) indicate whether learners who received ICT-interventions performed significantly better than those that did not receive ICT-interventions in the second term, and also show whether reading improvement at

certain schools (A-E) was more pronounced than at other schools. In this way, sub-question 2 can be answered from the results of the quantitative data.

The next section discusses the quantitative analyses according to the framework set out in this sub-section.

4.4.1.4 Presentation and discussion of quantitative results

Frequencies that describe the research context are presented in Tables 4.11 and 4.12. The variables analysed to describe the research context include participant responses as to their designations; gender; age; post level; qualifications; experience; number of lesson periods per week; workshop attendance and the location of the school. The frequency distributions on these variables/ attributes of participants are reported in Tables 4.11 and 4.12 below.

Table 4.11: Description of participants

	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
SBST	38	80.85	38	80.85
LSE	9	19.15	47	100.00
Gender				
Female	42	89.36	42	89.36
Male	5	10.64	47	100.00
Age (Missing = 8)				
20-29 years	7	17.95	7	17.95
30-39 years	6	15.38	13	33.33
40-49 years	15	38.46	28	71.79
50-59 years	10	25.64	38	97.44
>59 years	1	2.56	39	100.00
Post level				
Teacher	40	85.11	40	85.11
HOD	7	14.89	47	100.00
Qualifications				
20-29 years	7	17.95	7	17.95
3-yr Diploma	6	12.77	6	12.77
4-yr Degree & Diploma	19	40.43	25	53.19
B Ed Hons	18	38.30	43	91.49
Masters	1	2.13	44	93.62
Other	3	6.38	47	100.00
Years' experience (missing = 2)				
0-5 years	6	15.38	13	33.33
6-10 years	15	38.46	28	71.79
11-15 years	10	25.64	38	97.44
>21 years	1	2.56	39	100.00

Table 4.12: Workload of participants

	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Periods per week (missing = 8)				
< 10 periods	3	7.69	3	7.69
10-19 periods	3	7.69	6	15.38
20-29 periods	6	15.38	12	30.77
30-39 periods	9	23.08	21	53.85
40-49 periods	12	30.77	33	84.62
>49 periods	6	15.38	39	100.00
Training attended (missing = 8)				
0	28	59.57	28	59.57
1	6	12.77	34	72.34
2	5	10.64	39	82.98
3	4	8.51	43	91.49
4	3	6.38	46	97.87
5	1	2.13	47	100.00
School locality				
Township	3	7.69	6	15.38
City	42	89.36	42	89.36

From Tables 4.11 and 4.12, it can be derived that most participants were women from the SBST. Over 50% of the respondents fell in the 40-59 age bracket and almost 80% of the participants were in possession of either a four-year degree and diploma, or a B Ed. degree. Most participants had between 10 and 29 years teaching experience. The greater proportion of participants presented between 30 to 49 lesson periods per week and almost 90% of the schools where participants taught were situated in the city.

The information in these tables paint a picture of participants that are, on average, well qualified, mature in age; with ample experience and a reasonable to heavy workload. One could conclude that their qualifications, maturity and experience might have a positive effect on supporting learners experiencing reading difficulties. However, those with a heavy work load might experience challenges in supporting learners experiencing reading difficulties.

4.4.1.5 Background on reading difficulties

The variables/ questionnaire questions analysed to describe the type of learner (reading difficulties) in this study include the sections on the number of learners experiencing reading difficulties; as well as 'Topic A: factors that possibly contribute

towards reading difficulties'; 'Section B: perceived implications of reading difficulties'; 'Section C: perceived trends that exist under learners experiencing reading difficulties'; 'Section D: learners' reading ability (reading stage)'. The results are presented in Table 4.3.

Table 4.13: Number of learners experiencing reading difficulties

No of learners (ni)	Frequency*	Percentage	Cumulative frequency	Cumulative percentage
96	7	14.89	7	14.89
98	1	2.13	8	17.02
100	1	2.13	9	19.15
111	1	2.13	10	21.28
150	10	21.28	20	42.55
200	8	17.02	28	59.57
215	8	17.02	36	76.60
225	1	2.13	37	78.72
250	10	21.28	47	100.00

It should be noted that in the composite frequency distributions presented in this chapter, the five-level rating scale of 'proportion-of-learners-affected' (or frequency-of-use) for each subset of questions where this rating scale applied were condensed to three categories namely, 'almost none/small proportion; approximately 50%; and substantial/ or large proportion; (or, never/seldom; sometimes; often/always). The composite frequency distributions of the comprehensive rating scales are included in Appendix C. The condensed rating scale was used in the composite frequency tables included in this chapter because the condensed scale simplifies the comparison of items within a theme (sparse cells – with low frequency-counts are minimised) to decide, for example, which issues (say, within the factors that possibly affect reading ability theme) are more often present and which less often.

The composite one-way frequency tables (Tables 4.14 to 4.17) follow after the discussion.

4.4.1.6 Deductions derived from Tables 4.14 to 4.16

The entries/ or levels of developed alphabetic principles and developed print knowledge appear to be the reading stage/s most participants evaluate learners to be on.

Almost 79% of the respondents indicated that between 150 and 250 learners in their schools experience reading difficulties (Table 4.14). This indicates a perceived high incidence of reading difficulties among learners in the particular schools.

Table 4.14: Possible contributing factors towards reading difficulties

Items Frequency Row Percentage	Proportion of learners possibly affected by listed factors			Total
	almost none/ small proportion	approx. 50%	substantial/great proportion	
Factors: intellectual	30 63.83	11 23.40	6 12.77	47
Factors: LANGUAGE PROBLEMS	16 34.04	12 25.53	19 40.43	47
Factors: LEARNING FACTORS	19 40.43	14 29.79	14 29.79	47
Factors: PHYSICAL/MEDICAL FACTORS	36 76.60	9 19.15	2 4.26	47
Factors: HEARING PROBLEMS	43 91.49	3 6.38	1 2.13	47
Factors: VISUAL PROBLEMS	41 87.23	6 12.77	0 0.00	47
Factors: SOCIO-ECONOMIC PROBLEMS	19 40.43	7 14.89	21 44.68	47
Factors: SOCIAL PROBLEMS	16 34.04	10 21.28	21 44.68	47
Factors: CULTURAL PROBLEMS	26 55.32	11 23.40	10 21.28	47
Factors: HERIDITARY INFLUENCES	34 72.34	7 14.89	6 12.77	47
Total	280 59.57%	90 19.15%	100 21.28%	470
The probability of the Chi-square statistic assuming the value of $106.27 < 0.0001^{***}$ Significance legend: *: statistical significance on the 5% level; **: statistical significance on the 1% level; ***: statistical significance on the 0.1% significance level ²⁹				

However, in the last row of Table 4.14, the proportion of total responses to the 'none/ small proportion of learners'-category to all items is substantially larger than the proportion of 'substantial/ great proportion of learners'-category to all items (59.57% compared to 21.28%). Therefore, the deduction can be made that participants in

²⁹ Please note: the legend for *statistical significance* is included in Table 4.3, and not repeated in the other tables. It applies to all tables in this chapter.

general did not perceive that learners experiencing reading difficulties were also affected by the listed factors to any great extent. In other words, they did not perceive these factors to be very influential.

If the individual response patterns (individual row frequencies and percentages in Table 4.14) are further investigated, language, socio-economic factors, and social problems stand out as factors that affect learners experiencing reading difficulties most acutely since proportions of over 40% ‘substantial/ great proportion of learners’ were indicated in these instances. In this way, the composite frequency table assists in identifying probable, important, contributory/ co-existing factors. The fact that the Chi-square test³⁰ statistic for this distribution is statistically significant on the 0.1% level of significance, implies that some of the individual response patterns (individual rows of the table) – over the proportions – differ statistically significantly from other response patterns. In this case the most obvious are the three factors of language; socio-economic and social problems. From the combined and individual response patterns reported in Table 4.15, the same deductions can be made about the implications of reading difficulties: In the last row of Table 4.15, the proportion of total responses to the ‘none/ small proportion of learners’-category to all items is greater than the proportion of ‘substantial/ great proportion of learners’-category to all items, (40.86% compared to 29.57%). It can be derived that participants in general did not perceive that learners experiencing reading difficulties suffered greatly from the listed reading implications.

Table 4.15: Perceived implications of reading difficulties

Items	Frequency of event			Total
Frequency Row Percentage	almost none/ small proportion	approximately 50%	substantial/great proportion	
Implication: LOW COMPREHENSION	17 36.17	10 21.28	20 42.55	47
Implication: low RETENTION	23 48.94	12 25.53	12 25.53	47
Implication: POOR WORD RECOGNITION	18 38.30	15 31.91	14 29.79	47

³⁰ Chi-square tests are used to determine whether an established frequency distribution can be reconciled with an assumed theoretical distribution (Steyn, Smit, Du Toit & Strassheim, 1999: 549).

Items	Frequency of event			Total
Frequency Row Percentage	almost none/ small proportion	approximately 50%	substantial/great proportion	
Implication: LIMITED VOCABULARY	16 34.04	16 34.04	15 31.91	47
Implication: DIFFICULTY DECODING PHONICS	20 42.55	18 38.30	9 19.15	47
Implication: POOR STRUCTURAL ANALYSIS	19 40.43	20 42.55	8 17.02	47
Implication: LACK FLUENCY SKILLS	16 34.04	20 42.55	11 23.40	47
Implication: POOR SPELLING	15 31.91	12 25.53	20 42.55	47
Implication: POOR SELF-ESTEEM	23 48.94	12 25.53	12 25.53	47
Implication: BEHAVIOURAL PROBLEMS	25 53.19	4 8.51	18 38.30	47
Total	192 40.86%	139 29.57%	139 29.57%	470
The probability of the Chi-square statistic assuming the value of 33.50 = 0.02*				

If the response rate of individual implications is further investigated, the following stands out more distinctly, namely:

- low comprehension;
- poor spelling; and
- behavioural problems.

With similar reasoning applied to Table 4.16, it can be derived that participants strongly perceived that ‘trends’ in general do not necessarily accompany reading difficulties (a none/ to small proportion response of 56.60% as opposed to a substantial/ great proportion of 20.41%). Specific trends indicated by participants as coinciding to a greater extent include:

- difficulty adapting from home to first additional language;
- low reasoning capacity;
- avoidance of reading activities, and

- low motivation.

Table 4.16: Possible trends accompanying reading difficulties

Item Frequency Row Percentage	Proportion of learners affected			Total
	almost none/ small proportion	approximately 50%	substantial/great proportion	
Tendency: STRUGGLE ADAPT HOME - FA LANGUAGE	17 36.17	14 29.79	16 34.04	47
Tendency: DROP OUT OF SCHOOL	39 82.98	6 12.77	2 4.26	47
Tendency: ENGAGE, CRIMINAL ACTIVITIES	42 89.36	3 6.38	2 4.26	47
Tendency: NON- PARTICIPATION COMMUNITY ACTIVITIES	35 74.47	9 19.15	3 6.38	47
Tendency: ARE EMOTIONALLY DRAINED	29 61.70	14 29.79	4 8.51	47
Tendency: EXPERIENCE BEHAVIOURAL PROBLEMS	19 40.43	16 34.04	12 25.53	47
Tendency: FAIL ACADEMICALLY	22 46.81	17 36.17	8 17.02	47
Tendency: POSSESS LOW REASONING CAPACITY	23 48.94	8 17.02	16 34.04	47
Tendency: AVOID READING ACTIVITIES	19 40.43	13 27.66	15 31.91	47
Tendency: LESS MOTIVATED	21 44.68	8 17.02	18 38.30	47
Total	266 56.60%	108 22.99%	96 20.41%	470
The probability of the Chi-square statistic assuming the value of $85.39 < 0.0001^{***}$				

Table 4.17 probes learners' reading stage/ skills where a percentage of participants' perceived trends are considered. In this case, the proportion of teacher-participants that perceive that approximately 50% of learners have mastered a specific reading stage as well as a substantial/ or great proportion are considered as a category. The levels of developed alphabetic principles and developed print knowledge appear to be the reading stage/s for most learners because they scored high percentages in both the column of approximately 50% and substantial/ or great proportion.

Table 4.17: Learners' reading stages

Items	Proportion of learners			Total
Frequency Row Percentage	almost none/ small proportion	approximately 50%	substantial/great proportion	
Read stage: EMERGENT LITERACY	29 61.70	15 31.91	3 6.38	47
Read stage: BEGINNING TO READ	24 51.06	16 34.04	7 14.89	47
Read stage: FLEDGING	29 61.70	16 34.04	2 4.26	47
Read stage: DEVELOPING	25 53.19	16 34.04	6 12.77	47
Read stage: MATURE READERS	23 48.94	15 31.91	9 19.15	47
Read stage: ARE PHONOLOGICALLY AWARE	25 53.19	18 38.30	4 8.51	47
Read stage: PHONEMIC AWARENESS IS DEVELOPED	23 48.94	20 42.55	4 8.51	47
Read stage: DEVELOPED VOCABULARY	22 46.81	24 51.06	1 2.13	47
Read stage: DEVELOPED ALPHABETIC PRINCIPLES	19 40.43	19 40.43	9 19.15	47
Read stage: DEVELOPED PRINT KNOWLEDGE	21 44.68	17 36.17	9 19.15	47
Total	240 51.06%	176 37.44%	54 11.48%	470
The probability of the Chi-square statistic assuming the value of 23.09 = 0.19				

This section can be concluded by stating that knowledge on the listed issues explains the problems and issues that learners and teachers deal with when it comes to reading difficulties and provides another angle in interpreting the more specific analysis results on the experience of the utilisation of ICTs and the effectiveness of ICTs in supporting reading difficulties. A summary of the findings of this section is given in Table 4.26.

4.4.2 Respondents' experience of the use of ICTs

The interpretation of analysis findings to explain teachers' ICT experiences in this section includes interpretation of response patterns on the themes of:

- screening tools used;
- availability of ICTs;
- ICT use to ID learners experiencing reading difficulties;
- ICT usage to support learners experiencing reading difficulties;
- required training relevant ICTs implementation.

The composite frequency tables (Tables 4.18 – 4.19) on these themes are included following the deductions section below.

The last row of Table 4.18, the totals-row, indicates that the more or less the same proportion of never/ seldom and often/always were response-frequencies (38.09% and 37.87%) reported for the utilisation of screening tools in general. This implies that some individual tools were used more extensively (e.g. guided reading with a 59.57% often/ always response), while other tools were used less often/ seldom (e.g. ICTs with a 70.21% never/ seldom response) and there was great variability in use.

If the response patterns of individual tools are investigated (the row frequency patterns), it becomes apparent – as illustrated in the previous paragraph - that some individual response patterns differ from others (this fact is also corroborated in the fact that the Chi-square-statistic for the frequencies of Table 8 is statistically significant on the 0.1% level of significance. Significance in this instance indicates that the row-wise response pattern of some items ('screening tools') differ statistically significantly from others). Tools most often used include:

- rubrics (44.68% often/always responses);
- language experience approach (46.81% often/ always responses);
- guided reading (59.57% often/always responses); and
- integrated reading approach (53.19% often/ always responses)

It is important to note that of the listed tools, ICTs are reported to be seldom used by the majority (70.21%) of the participants.

The totals-row of Table 4.18 – the availability of ICTs - indicates that by far the majority of teacher-participants (73.4% overall never/ seldom response) stated that all ICT-related tools/ appliances are not freely available. The exception to the rule may be that reading-support program-apps (42.55% never/ seldom responses, and 23.40% often/ always responses). This exception to the rule is verified with the statistically significant Chi-square test statistic for the distribution of this table (significance level of 0.1%) which indicates that some response patterns (reading-support apps in this instance) differ statistically for other items' response pattern.

Table 4.18: Use of reading-screening tools

Items	Frequency-of-use			Total
Frequency Row Percentage	never/ seldom	sometimes	often/ always	
Screen: INFORMAL READING INVENTORIES	17 36.17	12 25.53	18 38.30	47
Screen: NORM REFERENCE TESTS	22 46.81	12 25.53	13 27.66	47
Screen: STANDARD-BASED TESTS	22 46.81	10 21.28	15 31.91	47
Screen: PORTFOLIOS	21 44.68	14 29.79	12 25.53	47
Screen: RUBRICS	13 27.66	13 27.66	21 44.68	47
Screen: RESPONSE TO INTERVENTION	12 25.53	17 36.17	18 38.30	47
Screen: LANGUAGE EXPERIENCE APPROACH	17 36.17	8 17.02	22 46.81	47
Screen: GUIDED READING	8 17.02	11 23.40	28 59.57	47
Screen: INTEG RATED APPROACH	14 29.79	8 17.02	25 53.19	47
Screen: ICTs	33 70.21	8 17.02	6 12.77	47
Total	179 38.09%	113 24.04%	178 37.87%	470
The probability of the Chi-square statistic assuming the value of $53.54 < 0.001^{***}$				

The totals-row of Table 4.19 indicates that generally, the majority of teacher-participants do not use ICTs extensively to identify learners experiencing reading difficulties (an overall 45.48% never/ very seldom and a 36.70% sometimes response was reported). In particular, between 68.09% to 48.94% of participants offered a never/ very seldom response to:

- downloading of pre-loaded reading-screening tools
- selecting of relevant screening tools for different reading difficulties
- design of reading-screening tools to identify reading difficulties
- uploading and saving designed reading-screening tools

A somewhat more frequent response was reported for the items of:

- learner classification by reading ability;
- identification of reading-support required; and
- the level of support required to assist reading difficulties.

Table 4.19: Availability of ITCs

Availability of ICTs facilities				
Items	Availability level			Total
Frequency Row Percentage	never/ seldom	sometimes	often/ always	
AVAILABILITY, Lab computers	25 53.19	13 27.66	9 19.15	47
AVAILABILITY, tablets for learners	40 85.11	5 10.64	2 4.26	47
AVAILABILITY, supporting software, LRD	34 72.34	11 23.40	2 4.26	47
AVAILABILITY, reading-support programmes/apps	20 42.55	16 34.04	11 23.40	47
AVAILABILITY, e-readers	40 85.11	6 12.77	1 2.13	47
AVAILABILITY, digital screening tools	38 80.85	8 17.02	1 2.13	47
AVAILABILITY, laptops for teachers	37 78.72	8 17.02	2 4.26	47
AVAILABILITY, interactive smart boards	39 82.98	7 14.89	1 2.13	47
AVAILABILITY, earphones for learners	39 82.98	4 8.51	4 8.51	47
AVAILABILITY, tape recorders	33 70.21	10 21.28	4 8.51	47
Total	345 73.40%	88 18.73%	37 7.87%	470
The probability of the Chi-square statistic assuming the value of 56.82 < 0.0001***				

The totals-row in Table 4.20 – Section H, ICTs, internet/ laptop utilisation to support reading difficulties – indicate that the majority (50.54%) of participants generally never/

very seldom use ICTs to support learners' reading difficulties (only a total of 26.17% often/ always responses were reported over all question items).

Table 4.20: Use of ICTs to identify learners experiencing reading difficulties

Reading difficulties				
Items	Frequency-of-use levels			Total
Frequency Row Percentage	never/ seldom	sometimes	often/ always	
Download screening tools to ID reading difficulties	32 68.09	9 19.15	6 12.77	47
Select different tools to ID different reading difficulties	29 61.70	10 21.28	8 17.02	47
Design reading-screening tools to ID reading difficulties	23 48.94	16 34.04	8 17.02	47
Upload and save designed screening tools	26 55.32	17 36.17	4 8.51	47
For identifying the reading levels of learners	19 40.43	20 42.55	8 17.02	47
Classify learners according to reading levels	15 31.91	22 46.81	10 21.28	47
Identifying the type of reading-support learners require	14 29.79	21 44.68	12 25.53	47
Identifying the level of support learners require	13 27.66	23 48.94	11 23.40	47
Total	171 45.47%	138 36.7%	67 17.8%	376
The probability of the Chi-square statistic assuming the value of 34.40 = 0.002***				

In particular, investigation of individual row-wise response patterns indicated that over 55% never/ seldom responses were reported for the items of:

- downloading of reading-support lessons from the internet
- creating own reading-support lessons using a laptop/ computer
- design of ISPs using a laptop/ computer
- providing online feedback re learners reading progress to parents
- electronic capturing of parent responses to online progress reports

However, an often/ always response of between 36.17% to 44.68% was reported for the items of:

- preparation of reading assessment tasks using a laptop/ computer

- electronic recording of learners' reading progress

The interpretation of the findings of Tables 4.19-4.22 serve to answer to sub-question 1 on teachers' experiences supporting learners experiencing reading difficulties. The next subsection interprets the findings of Table 4.21, the perceived effectiveness of ICTs in addressing reading difficulties and the pairwise t-test for reading performance, to answer to sub-question 2, namely the effectiveness of ICTs to address learners' reading difficulties.

The totals-row of Table 4.21, required ICT training, indicates that a total of 54.78% no/ limited training responses were reported for the construct of training required when performing specific tasks, and an 83.08% no/ limited/ to some training total response. This shows that teacher-participants did not feel that they really require training in ICT to do their jobs.

Table 4.21: Use of ICTs to support learners experiencing reading difficulties

Use of ICT.s to support learners reading difficulties				
Item	Frequency-of-use			Total
Frequency Row Percentage	never/ seldom	sometimes	often/ always	
ICT Support: browse internet, read support lessons	24 51.06	13 27.66	10 21.28	47
ICT Support: download read support lessons	30 63.83	9 19.15	8 17.02	47
ICT Support: Create own support lessons	30 63.83	7 14.89	10 21.28	47
ICT Support: Design ISP.s	26 55.32	7 14.89	14 29.79	47
ICT Support: Review/ update ISP	21 44.68	14 29.79	12 25.53	47
ICT Support: prepare reading assessment tasks	15 31.91	15 31.91	17 36.17	47
ICT Support: evaluate reading progress	16 34.04	15 31.91	16 34.04	47
ICT Support: record read progress	15 31.91	11 23.40	21 44.68	47
ICT Support: online feedback, parents	32 68.09	9 19.15	6 12.77	47
ICT Support: record parents' responses	29 61.70	9 19.15	9 19.15	47
Total	238 50.64%	109 23.19%	123 26.17%	470
The probability of the Chi-square statistic assuming the value of 40.73 = 0.002**				

Investigation of the individual row frequency patterns also reveal similar response patterns for specific tasks – in other words, the majority of participants indicated for each of the individual tasks that they did not really require training to perform specific tasks (no/ limited training responses for individual tasks varied between 63.83 and 48.94%). The non-significance of the Chi-square test affirms similar response patterns for individual items/ tasks.

The crux of the findings of this section – in answering to sub-question 1 on the experiences of teachers supporting learners (using ICTs) with reading difficulties – reveals that:

- teachers do not use ICTs extensively. They rather use rubrics, language experience approach, guided reading and an integrated reading approach;
- teachers experience that ICT applications/ tools are not freely available (with perhaps the exception of reading-support programmes/ or apps, which is indicated as somewhat more available);
- teachers do not use ICTs extensively to identify learners experiencing reading difficulties. These especially include downloading of reading-screening tools; selecting different screening tools to identify different reading difficulties; electronic/ pc-based design of screening tools; and uploading of such designed tools;
- teachers do not use ICTs extensively to support learners with identified reading difficulties;
- teachers indicated that they did not really require ICT training to perform specific reading-support tasks.

These findings paint a picture of teachers that do not have free access to computer/ laptop technology, and, therefore, do not truly know the benefits of ICTs applied to reading difficulties of learners and do not feel the need to be trained in ICTs.

Table 4.22: Teachers' ICTs training required

Training required (in ICTs)				
Items	Level of need/ frequency-of-use			Total
Frequency Row Percentage	no/ limited training	some training	substantial/ extensive training	
Training: In internet usage	25 53.19	18 38.30	4 8.51	47
Training: Download prepared reading-support lessons	26 55.32	13 27.66	8 17.02	47
Training: Create own digital support lessons	22 46.81	15 31.91	10 21.28	47
Training: Design IT-based ISP program	23 48.94	16 34.04	8 17.02	47
Training: Review/ revise designed ISP	23 48.94	18 38.30	6 12.77	47
Training: Preparation, read-assessment task	30 63.83	8 17.02	9 19.15	47
Training: How evaluate reading progress	29 61.70	10 21.28	8 17.02	47
Training: Electronic capturing reading progress	28 59.57	12 25.53	7 14.89	47
Training: To provide online feedback to parents	26 55.32	12 25.53	9 19.15	47
Training: Capture/ save parent feedback electronically	25 53.19	11 23.40	11 23.40	47
Total	257 54.78%	133 28.30%	80 17.02%	470
The probability of the Chi-square statistic assuming the value of 14.67 = 0.68				

The next section discusses the results of quantitative analyses pertaining to sub research question 2.

4.4.3 The effectiveness of ICTs (sub research question 2)

A composite one-way frequency table, a pairwise t-test and ANOVA to evaluate were used to answer to research question 2 concerning the effectiveness of ICTs in assisting learners reading difficulties. The results of three analyses are reported and interpreted in this section, namely

- A composite frequency table (Table 4.13) of participant responses to section I of the questionnaire, namely, 'The effectiveness of ICTs in addressing reading difficulties', and,

- A pairwise (pre-post) t-test on the performance figures drawn from the performance reports of learners (learners') prior to and after the use of ICTs to improve reading difficulties (Table 4.14)
- An ANOVA (using the GLM approach) to determine whether ICTs-intervention and the particular school that learners attend make a statistically significant impact on learners' reading ability/ problems (Table 4.15 and 4.15a). The analysis is also performed on the reading-progress report data of learners.

4.4.3.1 Effectiveness of ICTs

The totals-row of Table 4.23 indicates that approximately a third of overall responses was awarded to each of the three categories of not effective/ slightly; moderately effective; and effective/ highly effective. The Chi-square statistic associated with the frequencies of Table 4.23 was also non-significant: this implies that the response pattern of the individual items (the individual row percentages), over the levels of not effective/ slightly; moderately effective; and effective/ highly effective, did not differ for the various items – the same response pattern was reported for all items of Table 4.23. This result – the wide spread of responses over the three effectiveness-levels – can be interpreted as signifying that participants were not convinced or were unsure of whether the ICTs were indeed effective: approximately equal proportions of participants indicated not effective/ slightly; moderately effective; effective/ highly effective.

If the fact is taken into account that participants did not actively engage with ICTs tools and applications (as indicated in answering to sub-question 1), this result seems plausible: if teachers do not use tools and applications extensively, they cannot be confident/ do not have experience to anticipate a positive outcome.

Table 4.23: Perceived effectiveness of ICTs

Items	Efficiency level			Total
	not effective/slightly	moderately	effective – very effective	
EFFECTIVENESS, increased learner-interaction	19 40.43	17 36.17	11 23.40	47
EFFECTIVENESS, improved learner independence	18 38.30	15 31.91	14 29.79	47
EFFECTIVENESS, improved word recognition	16 34.04	17 36.17	14 29.79	47
EFFECTIVENESS, improved pronunciation	18 38.30	14 29.79	15 31.91	47
EFFECTIVENESS, increased vocabulary	15 31.91	15 31.91	17 36.17	47
EFFECTIVENESS, enhanced comprehension	13 27.66	16 34.04	18 38.30	47
EFFECTIVENESS, improved reading fluency	14 29.79	14 29.79	19 40.43	47
EFFECTIVENESS, improved grasp on reading skills	15 31.91	18 38.30	14 29.79	47
EFFECTIVENESS, improved academic performance	15 31.91	16 34.04	16 34.04	47
EFFECTIVENESS, improved teacher confidence in learners with RP	17 36.17	15 31.91	15 31.91	47
Total	160 34.04%)	157 33.40%)	153 32.56%)	470
The probability of the Chi-square statistic assuming the value of 6.29 = 0.99				

4.4.3.2 Interpretation of paired t-test and analysis of variance results

To further investigate the effectiveness of ICTs reading-support mechanisms in Table 4.23 – apart from the perceptions expressed by participants in Table 4.13 – independent analyses were done on data from learners' reading-progress reports over two terms (at five different schools), to assess whether learners' reading ability had progressed. Some learners received reading-support attention during the second term – labelled group '1' learners. Paired term 1 and term 2 reading-progress observations per learner were captured and progress in reading performance was analysed in a paired t-test and ANOVA. The general linear model, or GLM, approach to ANOVA was used. These analyses allowed the researcher to assess – independently from the questionnaire data – whether statistically significant and positive reading progress was

indeed reported for learners who had received ICTs reading-support (group '1' learners) as compared to learners who had not received ICTs reading support. (group '2') learners.

Table 4.24 below reports the results of a simple paired t-test performed on the differences between pre- and post-ICTs-intervention marks for the group 1 learners (the learners who received ICTs reading support). The test is based on the argument that if the intervention was not effective, the mean difference between pre- and post-marks for all learners would not be statistically significantly different from zero. However, if the ICTs-intervention was indeed effective, the paired t-test would indicate that the mean difference between pre- and post-intervention marks for all learners was statistically significantly if it was greater than zero.

Table 4.24: Results of paired t-test for pre- and post-reading support

Statistics										
Diff.	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err	Min	Max
mark2 – mark1	55	0.067	0.047	0.027	0.0629	0.0748	0.0921	0.0101	0.34	0.1

T-Tests			
Difference	D F	t Value	Pr > t
mark2 – mark1	54	4.67	<.0001

In Table 4.24, the probability (Pr >|t|) associated with the t-statistic of 4.67 is <0.0001 – which signifies statistical significance on the 0.1% level. Therefore, it can be concluded that for the learners who did receive ICT reading support, there was a slight but statistically significant improvement in reading ability. The mean difference between pre- and post-intervention marks is 0.047 – which represents a small (but statistically significant) positive improvement. Participants who completed the questionnaire were not certain whether ICTs were effective, and the small, but statistically significant increase established with the t-test corresponds with the

uncertainty which participants expressed to questions related to ICT effectiveness ('was there an improvement or not?').

At this stage, the question might well be asked whether learners that received ICTs reading support performed statistically significantly 'better' (the group 1 learners) than those who did not receive ICT reading support (during the second term, the group 2 learners).

To answer to this question, an ANOVA (using the GLM approach) was performed on the difference between learners' term 2 and term 2 reading performance scores to determine whether a statistically significant difference existed between (i) the means of the differences of (term 2 – term 1) reading scores for groups 1 and 2, and (ii) whether at some schools (five schools) reading progress was more enhanced than at other schools. Table 4.25 below reports on the results of the two-factor ANOVA results.

In Table 4.25, the probabilities associated with the effect of learner groups (groups 1 and 2) as well as schools ('school') are < 0.0001 – which signifies statistical significance on the 0.1% level. This means that (i) in the first place the mean differences (term2 – term1) for learner groups 1 and 2 differ statistically significantly from one another. In Table 4.25a the two means are reported as 0.047 (which rounds to 0.05) and -0.039 (which rounds to -0.04). This means that a positive difference – thus a positive increase in reading progress is reported for learners who received ICTs reading support as opposed to a negative reading-progress difference for learners who did not receive ICT reading support.

Table 4.25: ANOVA: reading performance scores

ANOVA: performed on the differences between mark 2 and mark 1 reading performance scores for all learners (N=120) to investigate the statistical significance of group (supported and not-supported learners) and school (schools 1 to 5)					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.29347854	0.03260873	10.57	<.0001
group (group1/2)	1	0.21327337	0.21327337	69.12	<.0001
school (schools 1-5)	4	0.06819466	0.01704866	5.53	0.0005
school*group	4	0.01201051	0.00300263	0.97	0.4257
Error	103	0.31782765	0.00308571		
Corrected Total	112	0.61130619			
ANOVA assumptions: Normality of residuals and homogeneity of group variances adhered to R-square = 0.48 mean difference = 0.0025					

Secondly Table 4.25 indicates that schools (Schools A to E) showed a statistically significant effect on reading progress: some schools showed markedly more improvement than others. Table 4.25a indicates that school 1 (labelled 'A' in the thesis) performed best with regard to reading progress and school 2 (labelled 'B' in the thesis) the worst.

It can therefore be concluded that the joint analysis of response patterns within a frequency table, a t-test and ANOVA results verified that a small, but statistically significant improvement in reading ability was established when ICT reading support was provided to learners. This answers to the second sub research question.

Table 4.25a: Comparison of mean results

Table 15a Bonferroni multiple comparison of means results included to indicate how groups and schools differ statistically significantly from on another Means with the same letter are not significantly different. Lsd = 0.047			
Effect of schools			
Bon Grouping	Mean	N	School
a	0.04375	24	1
ab	0.01652	23	4
b	- 0.00417	24	3
b	- 0.02348	23	5
b	- 0.02684	19	2

Table 15a Bonferroni multiple comparison of means results included to indicate how groups and schools differ statistically significantly from on another Means with the same letter are not significantly different. Lsd = 0.047			
Effect of schools			
Bon Grouping	Mean	N	School
Effect of groups			
a	0.04709	55	1
b	- 0.03983	58	2

It can therefore be concluded that the joint analysis of response patterns within a frequency table, a t-test and ANOVA results verified that a small, but statistically significant improvement in reading ability was established when ICT reading support was provided to learners. This answers to the second sub research question.

4.4.4 Summary of the quantitative findings

The summary of findings presented in Table 4.26 below sketches the context of the research and answer to the two sub research questions on teachers' experience of ICTs in supporting learners experiencing reading difficulties and the effectiveness of ICTs in supporting reading difficulties.

The crux of the findings describes teacher respondents as people who are well qualified with ample experience and learners reading skills to vary but to average out at the developed alphabetic principles stage and/ or developed print knowledge reading stage.

With regard to teacher experience supporting reading difficulties with ICTs, results suggest that participants do not use ICTs extensively either to support or identify learners experiencing reading difficulties (they use other tools to a greater extent); that ICTs are not freely available or accessible; and that they do not perceive that they need extensive (ICTs) training to perform their tasks in supporting learners experiencing reading difficulties.

Findings lastly indicate that participants' perceptions regarding the effectiveness of ICTs is rather one of indecision as evaluated against their responses to questions in of a questionnaire. On the other hand, analysis of reading-progress report data showed that a small but significant improvement in reading skills was attained for learners who received support to correct/ better reading difficulties.

Table 4.26: Summary of the quantitative analysis findings of Chapter 4

Context	Findings
<p>Tables 4.13-4.17</p>	<ul style="list-style-type: none"> Participants did not perceive that specific listed factors greatly affected learners experiencing reading difficulties The factors of <ul style="list-style-type: none"> language, socio-economic factors, and social problems were perceived to affect learners experiencing reading difficulties more often Participants did not perceive that specific implications coincided greatly with reading difficulties. However, the implications of <ul style="list-style-type: none"> low comprehension poor spelling, and behavioural problems were perceived to be more prominent with reading difficulties than other implications Participants perceive that specific listed trends did not necessarily co-occur with reading difficulties, Exceptions to the rule could be, <ul style="list-style-type: none"> difficulty adapting from home- to first additional language low reasoning capacity avoidance of reading activities, and low motivation With regard to reading stage, <ul style="list-style-type: none"> developed alphabetic principles and developed print knowledge appear to be the reading stage/s most participants evaluate learners to be on.
<p>Sub research question 1 Tables 4.18-4.21</p>	<ul style="list-style-type: none"> The questions on teachers' experiences while supporting learners experiencing reading difficulties show that with respect to reading-screening tools, the tool of ICTs is not often used, compared to several that are more often used namely, <ul style="list-style-type: none"> rubrics (44.68% often/always responses) language experience approach (46.81% often/ always responses) guided reading (59.57% often/always responses) integrated reading approach (53.19% often/ always responses) With respect to the <i>availability of ICT equipment/ accessories</i>, participant experience show – from the figures in Table 9 – that ICT equipment is not freely available with the exception of <ul style="list-style-type: none"> reading-support program-apps (42.55% never/ seldom responses, and 23.40% often/ always responses which indicates a somewhat higher level of availability)

Context	Findings
	<ul style="list-style-type: none"> With respect to the use of ICTs to identify reading difficulties it was indicated that the majority of participants do not use ICTs extensively to identify learners' reading difficulties. In particular more than approximately 50% (68.09% to 48.94%) of participants offered a never/ very seldom response to: <ul style="list-style-type: none"> downloading of pre-loaded reading-screening tools selecting of relevant screening tools for different reading difficulties design of reading-screening tools to identify reading difficulties uploading & saving designed reading-screening tools With respect to ICTs, internet/ laptop utilization to support reading difficulties – findings indicate that the majority (50.54%) of participants generally never/ very seldom use ICTs to support learners' reading difficulties (only a total of 26.17% often/ always responses were reported over all question items). Investigation of individual row-wise response patterns indicated that over 55% never/ seldom responses were reported for the items of: <ul style="list-style-type: none"> downloading of reading-support lessons from the internet creating own reading-support lessons using a laptop/ computer design of ISPs using a laptop/ computer providing online feedback re learners reading progress to parents electronic capturing of parent responses to online progress reports An almost 40% (36.17% to 44.68%) often/ always response was reported for: <ul style="list-style-type: none"> preparation of reading assessment tasks using a laptop/ computer electronic recording of learners' reading progress With regard to training, teachers indicated that they did not really require ICTs training to perform specific reading-support tasks
Sub-question 2 Tables 4.24, 4.25 & 4.25a	<ul style="list-style-type: none"> It can be concluded that the joint analysis of a frequency table and independent t-test and ANOVA verified that a small, but statistically significant improvement in reading ability was established when ICTs reading support was provided to learners. The ICTs reading support was effective to a meaningful but small extent. This answers the second sub-question.

The next section integrates the quantitative and qualitative findings – which illustrates how QUAL and QUAN components serve each other to enrich understanding of the researched phenomenon.

4.5 CONCLUSION: INTEGRATION OF QUALITATIVE AND QUANTITATIVE FINDINGS

As mentioned in section 4.1, the purpose of employing mixed methods design is to compare, validate and corroborate both QUAL and QUAN data. It should also be noted that the integration of QUAL and QUAN data in this study, is not merely achieved by looking at agreement or disagreement between findings, but also to position results in an explanatory context or framework.

This section therefore, theme wise, compare quantitative findings against interview findings and interprets the integrated findings against the research context.

- **Contributing factors:** In general, the quantitative findings indicated that participants were of the opinion that only a limited number of learners experiencing reading difficulties were affected by listed additional influential factors. An exception seems to be socio-economic and social problems where a high proportion of learners was indicated (44.68% in both instances). This finding corresponds with QUAL findings which the following narratives confirm (taken from section 4.3.2.1)

Participants mentioned socio-economic factors such as lack of parental support poverty (*"parents who do not afford basic reading material"* TH: School F) *"...I think also hunger ..."* (TI: School C), lack of parents (orphans) *"...they come from squatter camps andthey are orphans...some child headed families"* (TB: School A), lack of exposure to reading material, background, *"...most of the learners here at school are coming from informal settlement"* (TF: School A) which limit the access and use of the library *"Our kids are not using the library"* (TD: School A)

- **Implications of reading difficulties:** The quantitative analysis showed that participants did not perceive that specific listed implications were observed under a great proportion of learners experiencing reading difficulties (the exceptions being low comprehension, poor spelling and behavioural problems). These issues also arose in the narratives of teachers in the QUAL component of the study. For example, behaviour. Participants in the focus group interviews reported the following as potential the results of reading difficulties: behavioural problems such as being withdrawn, absenteeism, little interest in school work, lack of self-

confidence, lack of participation, incomplete written work, aggressive behaviour, lack of concentration, frustration, dropout, underperformance and failure.

- Tendencies that accompany reading difficulties: The quantitative analysis showed that participants perceived that specific listed trends do not necessarily co-occur with reading difficulties. Exceptions could be difficulty adapting to FAL, low reasoning capacity, avoidance of reading activities, low motivation. The interview data reports the same tendencies namely, qualitative
- Tools used when supporting learners experiencing reading difficulties and utilization of ICTs when supporting reading difficulties: The quantitative analyses showed that with respect to reading-screening tools, the tool of ICTs (referring primarily to computers or laptops) is not often used. More frequently used tools include rubrics, language experience approach, guided and integrated reading. In the interviews, interviewees mentioned a wide range of methods/ tools. They mentioned various support mechanisms that they use: curriculum adaptation, paired reading, peer reading, group reading, incidental reading, auditory programmes; the use of visual aids and ICTs such as videos, computers, cell phones, TV and audio-recorders. It was, however, noted that some of the participants could not differentiate between support mechanisms and teaching, and teaching and learning
- With regard to ICTs to support reading difficulties results of the quantitative and qualitative analyses are not directly comparable, because the quantitative questionnaire probed the use of specific applications of internet/ laptop use, whereas the qualitative interviews discussed preferences for ICT appliances (computers, videos, recorders, etc). Participants indicated that learners (not teachers) prefer computers – which interest learners – but, in the questionnaire, teachers' use of ICTs (especially computer/ laptop applications) was probed (not a range of ICTs). The information obtained from the different aspects of the quantitative and qualitative approaches served to enrich the knowledge gained on ICTs.
- Effectiveness of ICTs: The quantitative findings indicated that perceptions were undecided as to whether ICTs were effective in supporting reading difficulties, but that analysis of the reading-progress report data verified that ICTs (in support of

reading advancement) did bring about a small but significant positive change over two terms in reading progress. The qualitative component in this regard also concluded that participants were indecisive as to whether ITCs were effective but offered several reasons that ICTs could stimulate interaction among the learners, they enhance learner participation, and they make learning fun.

4.6 CHAPTER SUMMARY

In this chapter, the analysis from the QUAL data and QUAN statistical analysis were presented. The Description of respondents and descriptive statistics relating to the demographics of the respondents were reported on. Furthermore, the emergent themes were presented and outlined. Descriptive statistics of the variables were also discussed. Finally, the relationships between the variables were reported on using frequency tables. In the next chapter, the findings of both strands (QUAL and QUAN) were merged and discussed based on the thematic analysis. The results from the merged findings helped to draw conclusions which were presented in chapter 5 as well.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

“Once you learn to read, you will forever be free”.

(Douglass, 1845: 231)

5.1 INTRODUCTION

This study was motivated by the aspiration to explore ICTs in support of learners experiencing reading difficulties. Chapters 1 to 4 have incorporated the aim of this study with the central question as formulated in chapter 1 of this study: *What role do ICTs play in supporting learners experiencing reading difficulties in the selected FSS?* To address the aim relating to the improvement of learners’ level of academic achievement in FSSs, the three secondary research questions (section 1.5.2) need to be answered and the hypothesis (section 1.5.3) be accepted. This chapter briefly summarises the findings presented in chapter 4 above and use these findings to design of ICT-guidelines to assist and inform teachers in the utilisation of ICTs when supporting learners experiencing reading difficulties.

This chapter then serves as a concluding chapter, presents a summary of findings up to this stage and presents a designed ICT users’ guide. To this effect final recommendations are offered and the limitations of the study are highlighted and acknowledged. Considering the fact that Full Service Schools are also public ordinary schools, it should therefore be noted that the conclusions drawn may also be applicable to other public ordinary schools.

5.2 SUMMARY OF THE STUDY

In Chapter 1, the background to the study was outlined, the problem was described, and the motivation for this study was stated. Furthermore, the aim, research methodology employed, reliability, validity, trustworthiness, and significant concepts of the study were discussed. Aspects discussed were the reading difficulties situation globally, in sub-Saharan Africa including South Africa. The chapter also outlined the support for learners experiencing reading difficulties within the inclusive education processes and FSS as a support strategy in South Africa. Lastly, the chapter introduced the theories that form part of the theoretical framework that underpins this study.

Chapter 2 was devoted to the literature review, which incorporated a discussion on challenges, global trends and the implications of reading difficulties. These issues were then integrated in the theoretical framework of the study. In addition, the literature review considered various support mechanisms used to support learners experiencing reading difficulties. Support mechanisms include among others Response to Intervention, ICTs and scaffolding. Lastly, the literature review helped to clarify the research methodology in chapter 3 and further assisted with the consolidation of the empirical findings in chapter 4.

Chapter 3 focused on the research methodology. This study is essentially a triangulation, concurrent mixed methods research design. The study was guided by the constructivist paradigm because, with the use of ICTs, there are social constructions and interactions that take place and learners learn through the experiential and social environment.

Chapter 4 provided an analysis and interpretation of data collected concurrently by means of QUAL methods (focus group interviews and reading-screening and progress reports) and QUAN methods (structured questionnaire and structured observation sheet). The description of the FSS context – which includes a description of the participant-teachers and learners experiencing reading difficulties – formed the baseline against which advanced analysis results were interpreted. Analysis results of the QUAL and QUAN data were included following the contextual description. The findings from the analyses were furthermore interpreted and compared against scholarly views reported in the literature that focus on the support of learners experiencing reading difficulties.

Next, is the summary of the literature review and theoretical framework. The reason for the recap is that scholarly views regarding implications and trends of reading difficulties presented in chapter 2 form part of the research findings summarised in a subsequent section of this chapter.

5.3 SUMMARY OF THE LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The purpose of reviewing the literature for this study was to become acquainted with the available body of knowledge in relation to the significance of supporting learners experiencing reading difficulties using ICTs. The discussion was also driven by the

three theories, namely, Vygotsky's sociocultural theory, readers-response theory and e-reading theory which formed the theoretical framework that underpins this study.

5.3.1 Summary of the literature review

The scholarly views from the literature review provided insights in relation to the concept reading difficulties, on how it emanates, its trends and implications and lastly how it can be addressed. The literature review section started by defining the concept 'reading' as it necessitates the understanding of how reading difficulties emerge. What became evident is that reading comprises of (a) reading stages and (b) prerequisites, which need to be taken into cognisance when planning the support of learners experiencing reading difficulties. Short descriptions of the reading stages and prerequisites for reading are as follows:

- The reading stages namely: Emergent literacy, Beginning Reading, Fledgling Reading, Developing Reading and Mature Reading as discussed in chapter 2 (Section 2.2.2) were identified from studies of scholars such as Gillet, Temple, Temple and Crawford (2012: 13) and Tompkins (2010: 2). The discussion on reading stages highlighted the fact that if learners fail to meet the requirement of any of the stages, moving to the next stage becomes difficult. Reading stages were found to be an important aspect that should be considered when addressing reading difficulties. Thus, when administering any support mechanism such as ICTs, one should be mindful of whether the learners are achieving the reading stages as expected.
- Prerequisites for reading as suggested by Daly, Negebauer, Chafouleas and Skinner (2015: 59) include phonological awareness, phonemic awareness, vocabulary development, alphabetic principles and print knowledge. These prerequisites are discussed in Section 2.2.2. Chall, Jacobs and Baldwin (1990: 66) also supported the discussion on prerequisites for reading. These authors provided evidence that revealed a correlation between reading stages and prerequisites for reading. The evidence suggested that when prerequisites for reading are mastered, the reading stages can be achieved with ease. One of the more significant contributions that emerged from this discussion was the impact which prerequisites for reading have on the use of effective support mechanisms such as

ICTs. This contribution was found to have a link with the second secondary research question (Chapter 1:1.4.2.2).

From the investigation of the concept 'reading', reading difficulties were defined. The following conclusions emerged from the definition of reading difficulties: high-frequency types of reading difficulties, possible contributing factors, trends and implications of reading difficulties. For example, Cockrum and Shanker (2013) discuss the contribution of language acquisition as a possible contributing factor towards reading difficulties and specify the types of reading difficulties that may be caused by language problems (Section 2.3.3).

Factors that were found to be affecting learners experiencing reading difficulties were mostly intrinsic. Intrinsic factors are factors that are within the learner such as intellectual, physical, language and learning disabilities. Haager and Vaughn (1995), Jennings, et al. (2010), Lavoie (2007), Tur-Kaspa (2002) and Wong and Donahue (2002) discovered that issues such as poor self-esteem, dropping out of school and failure are some of the consequences of reading difficulties.

Trends in reading difficulties were drawn from global, Sub-Saharan and South African perspectives. The three areas exposed similar interpretations with trends from systemic evaluations namely, PIRLS and PISA, and, in sub-Saharan Africa, from Southern and Eastern Africa Consortium for Monitoring Education Quality (SAQMEC) showing dropping out of school, underperformance and illiteracy as consequences of reading difficulties. These viewpoints enhance the understanding of the negative impact that reading difficulties have around the globe.

The first section of the literature review ended with a discussion about supporting learners experiencing reading difficulties. This part of discussion revealed that for such learners to be properly supported, they should be screened first to determine their reading stage and the acquired prerequisites for reading. The discussion of the different support mechanisms (Section 2.5) revealed a need to integrate the support mechanisms in order to strengthen the support and close the gaps in the individual support mechanisms. That was supported by the views from the studies of Adams (1990), Anderson, Hiebert, Scott and Wilkison (1985) and Snow, Burns and Griffin (1998).

Lastly, ICTs as a support mechanism were found to be allied to Vygotsky's sociocultural theory which is one of the theories that form part of the theoretical framework that underpins this study. The literature also revealed from the studies of Hudson and Porter (2010) and Amin (2013) that the use of ICTs promotes learning that is more effective and efficient, independent and fun which relates to the main research question of this study (Section 1.4.1).

In conclusion, this section of the literature review contributed significantly to two major aspects of this study, namely, the role and the effectiveness of ICTs in supporting learners experiencing reading difficulties. This can be justified by comparing the analyses that revealed limited improvement yielded by some of the support mechanisms that were used as identified in the systemic evaluation studies with the findings from Hudson and Porter (2010) and Amin (2013) studies. What follows is the summary of the last part of the literature review which is the theoretical framework.

5.3.2 The summary of the theoretical framework

The theoretical framework formed the last part of the literature review, and it positioned the three theories (Vygotsky's sociocultural theory, readers-response theory and e-reading theory). The focus of the theoretical framework as outlined in Section 2.8 described the influence of these three theories on the primary aim of this study (Section 1.5).

During the separate discussions of the three theories, it was found that all three the theories relate to the use of ICTs for supporting learners experiencing reading difficulties (Section 2.9.1-2.9.3) The relationship between Vygotsky's sociocultural theory (specifically ZPD) and ICTs was demonstrated by studies conducted by Enochsson (2009) and Liu (2012) and was outlined in Section 2.8.1. A significant conclusion was that both Vygotsky's sociocultural theory and ICTs promote social interaction and learning. The significance of the relationship between readers-response theory and ICTs was found to be cooperative and peer learning, which is evident in the fourth step of readers-response theory and the findings from the study conducted by Mphahlele (2013).

The relationship between e-reading theory and ICTs is because e-reading theory promotes reading in electronic formats, which in itself is part of ICTs. The most striking result of the study on e-reading theory by Mikre (2011) is that learners who used

tutorial software in reading scored significantly higher on reading than those who were traditionally tutored. This links to the primary aim of this study (section 1.5).

Common to all three theories was the emphasis on ‘scaffolding’, which plays a vital role in supporting learners experiencing reading difficulties. Figure 2.6 in chapter 2 illustrates how the three theories interlink with the scaffolding through the ZPD where reading stages are also taken into account in determining the learner’s level of competence. Again, this notion echoes the same sentiment with the summary of the literature above in relation to the primary aim of this study.

Generally, the literature review (chapter 2) provided insight for this study regarding what causes reading difficulties, what reading difficulties are and how learners experiencing reading difficulties can be effectively supported. The theoretical framework also emphasised the significance of scaffolding when using ICTs to support learners experiencing reading difficulties.

5.4 A RECAP ON RESEARCH FINDINGS TO INFORM ICTS-GUIDELINE DEVELOPMENT

It is indicated in chapter 1 and 3 of this study that, a concurrent triangulation mixed methods research design was employed in this study. As a result, the empirical findings from QUAL and QUAN strands are merged as illustrated by Figure 3.2. According to Creswell, Plano Clark and Hanson (2003:209-240), the purpose of concurrent triangulation designs is to use both QUAL and QUAN data to more accurately define the dynamics within and between variables of interest. In this study, variables of interest were the thematic findings from QUAL analysis and statistical findings from QUAN analysis. For this study, the dynamics could successfully be assessed, described and integrated as discussed in Chapter 4.

A recap of the merged empirical findings is presented below to serve as a building block/ cornerstone in the design of the ICT users’ guide. The recap of the empirical findings starts off with a few prominent findings of teacher-participants’ experience when supporting learners experiencing reading difficulties (This addressed the first sub-research question).

5.4.1 Experiences of School-Based Support Team members and Learning Support Educators

Participants from QUAL strand shared their experiences of identifying possible contributing factors, types and implications of reading difficulties as indicated in Section 4.3.2.1. The response patterns reported in the frequency tables for the QUAN component in Section 4.4.4 report the perceived proportion of learners affected by the various factors that possibly contribute towards reading difficulties. In one analysis (Table 4.14) *language; socio-economic circumstances and social problems* emerged as very probable contributing factors. These findings seem very plausible when compared to, for example, responses of participants from focus interviews (QUAL component) who mention *language* as one of the most likely possible contributing factors of reading difficulties. In 4.3.2.1, these findings are corroborated by research reported in the literature.

The impact of reading difficulties – as mentioned in the literature review by independent researchers such as Moonsamy & Durbach, (2016); Gunning, (2010); Shanker & Cockrum (2009) – include, inter alia, *poor comprehension*. *Poor comprehension* was also identified as an important implication of reading difficulties in this research. In section 4.3.2.2, QUAL findings from reading-screening reports and focus group interviews in this research agree with the QUAN (Table 4.15) findings of *poor comprehension* as a very prevalent implication of reading difficulties (section 4.4.2.2).

Another critical observation that participants shared during the focus group interviews in this research was the impact of reading difficulties on learner performance. Learners' academic reports confirmed interviewees' opinions. The QUAN findings confirmed the perceptions indirectly. Poor spelling; low comprehension and behavioural problems reported in Table 4.15, section 4.4.2.2 are tell-tale predictor/signs of *poor performance*.

Looking at the findings above, it is safe to note that the shared experiences of SBSTs and LSEs are corroborated by the statistical findings together with the scholarly views in the literature review as discussed in Section 2.3, 2.4 and 2.5. This discussion served to illustrate that critical findings of the QUAL and QUAN analyses can serve as basis

for the design and development of an ICTs guidelines (to be discussed in section 5.7 still to follow).

5.4.2 Effectiveness of ICTs against other support mechanisms currently being used in the FSS to support learners experiencing reading difficulties

Drawing from the merged findings of QUAL and QUAN findings (Section 4.5), regarding the effectiveness of ICTs as a support mechanism for learners experiencing reading difficulties findings, indicated that participants were undecided as to whether ICTs were effective in supporting reading difficulties, but that analysis of the reading-progress report data verified that ICTs (in support of reading advancement) did effect a small but significant positive change over two terms in reading progress. The reason why the support process was over two terms is because an academic year has four terms and the first term is for identification, the second and third terms are for support and the fourth term is for assessment.

The qualitative component in this regard also concluded that interviewees were indecisive as to whether ITCs were effective but also offered arguments why they perceived ICTs could become effective in addressing reading difficulties in future.

5.4.3 A recap of other chapter 4 findings as a basis for ICT-guidelines

As indicated in the introduction to this chapter, the findings of the QUAL and QUANT components of the study should serve as basis for the development of an CT guideline.

Findings of relevance, in Chapter 4, furthermore indicate:

- Table 4.12, section 4.4.1.4, that teachers' workload is quite large – lesson periods for specific ICT reading support is limited (could more teachers/ specialists be appointed).
- Attention to especially additional factors of language (and language of the school); socio-economic problems and social problems (Tables 4.14 and 4.16, section 4.4.2.2) in the design of the ICTs guidelines.
- Implications: Tables 4.15 and 4.16 section 4.4.2.2, depending on the specific reading difficulties, exercise to improve comprehension, poor spelling, behaviour; reading activities (to combat avoidance of reading) first of all.
- Assess reading stage of learners regularly (Table 4.17).

- Availability, Table 4.19, section 4.4.2.3: the figures show that the availability of the various types of technologies is the greatest obstacle to teachers to use ICTs freely (and to get to know the value of specific technologies to aid specific problems). For teachers to decide which ICTs will be effective for what type of reading difficulties, need the freedom to have access to the ICTs and its applications. Without access, teachers are not motivated to discover the ICTs and its applications. It then remains a theoretical excursive. Could the ICT guidelines address this and suggest solutions learners experiencing reading difficulties will be well supported.
- Screening tools: Table 4.18, section 4.4.2.3: The fact that ICTs are very seldom used indicates that (apart from the unavailability of laptops/ computers) the value of ICTs are not known/ acknowledged. Teachers are not familiar with the types of ICTs and their special application fields – this should be explained and propagated under teachers – an ICTs guide is the ideal place to introduce and explain the various ICTs available to teachers.
- Use of reading-difficulties identification tools: (Table 4.20 and 4.21, section 4.4.2.3). The same argument can be made out – if teachers do not have access to the ICTs, they will not be familiar with or interested in the application that can be installed within these ICTs. The ‘story’ behind the low proportion of usage indicated for applications, design of development of reading level identification should be sought at availability and ICTs literacy: if a teacher does not use a laptop/ computer every day his/ her computer skills will be limited and negotiating the internet in itself will be a problem –not to mention the skill of searching for very specific topics on the internet and using ICTs applications to develop own reading tools. The ICTs guidelines could – for a start – suggest and guide use of a few basic, but useful reading applications and general Personal Computer use (e.g. using Windows Outlook, EXCEL and searches on the internet).
- Training, Table 4.22, section 4.4.2.3: the fact that teachers do not regard training as a priority to support reading difficulties via ICTs, could also point to the fact that teachers have limited access to ICTs applications and therefore have inadequate knowledge in using the applications and as a result they are unaware that they actually require training to use reading-difficulties apps.

5.5 LIMITATIONS OF THE STUDY

The limiting factor of this study lie in the fact that the data are drawn from only one District of Gauteng Province. Even though all FSS in the District were included, it may be challenging to generalise the findings of this study to other districts. As indicated in 5.8 above, there is a need for further research where the sample is representative of other districts.

The two terms for supporting learners experiencing reading difficulties were inadequate. There is a need for a longitudinal study which might be conducted in a three-year period to allow at least six terms of support.

The study was focused on a specific population, namely, SBSTs and LSEs and, for this reason, care should be exercised in generalising the findings to other contexts. However, the findings are sufficient to make recommendations to the Department of Education through the District office and the FSS concerning the use of ICTs as a support mechanism for learners experiencing reading difficulties.

5.6 CONCLUSIONS

The previous section linked the merged findings with the aim and objectives of this study. In this section, concluding remarks for this study which constitute the final analysis of this study are mapped against the research questions and the hypothesis formulated in chapter 1 (Section 1.5). Moving on now to consider the research questions, I start by exploring the research questions and providing the answers based on the findings.

The main research question was: *What role do ICTs play in supporting learners experiencing reading difficulties in the selected FSS?* The secondary research question 2 was: *How effective is the use of ICTs in supporting learners experiencing reading difficulties as compared to other support mechanisms?* These questions are explored together because they both examine the use of ICTs in supporting learners experiencing reading difficulties.

5.6.1 Conclusions on the main research question and the secondary research question 2

Paramount in exploring these questions are the QUAL findings extrapolated from Theme 6 “*Effectiveness of ICTs in supporting learners experiencing reading difficulties*” (Section 4.4.3) and QUAN findings from frequency table 13. The role that ICTs play in supporting learners experiencing reading difficulties as presented in chapter 4 can be determined as a supportive, collaborative and interactive role. It is alarming though that the effectiveness of ICTS as a support mechanism as seen in Table 4.9 has led to minima improvement in the academic performance. Drawing from the merged findings above, it can be concluded that the effectiveness of the use of ICTs is slightly statistically significant.

5.6.2 Conclusions on the secondary research question 1

Secondary research question 1 was: “*What are the experiences and views of SBST members and LSEs regarding the use of ICTs in supporting learners experiencing reading difficulties in FSS?*”

In exploring this question, the following themes emerged: Theme 1: *Possible contributing factors towards reading difficulties* (Section 4.3.2.1) Theme 2: *Types of reading difficulties* (Section 4.3.2.2) and Theme 3: *Effects of reading difficulties* (Section 4.3.2.3). In their experiences and observations, SBSTs and LSEs shared the views that corroborated the conclusions from the literature review that showed that there are possible contributing factors towards reading difficulties and that there are different types of reading difficulties which affect learners in different ways. What was interesting about these findings was that there does not seem to be any formal methods used to identify contributing factors for reading difficulties except through observation during teaching and learning activities. However, some SBST members indicated the use of baseline assessment.

The literature review in section 2.5 highlighted the importance of screening learners experiencing reading difficulties in order to determine their reading stages and acquired prerequisites for reading with the aim to support the learners who are in need. Studies by Gillet, et al (2012) and Jennings, et al. (2010) also revealed that identification of the reading stages and prerequisites for reading will help the teachers and anybody who is supposed to support learners experiencing reading difficulties to

administer the relevant support mechanism. Based on the scholarly views, it is worth concluding that there is a need for formal methods, which include screening tools to screen the learners experiencing reading difficulties prior to being given the support.

5.6.3 Conclusions on the secondary research question 3

Secondary research question three was: “*What guidelines can be developed for ICT learner support for learners experiencing reading difficulties in FSS??*” Secondary research question 3 can be grouped together with Theme 5: *Impact of the ICTs guidelines used for supporting learners experiencing reading difficulties* (Section 4.3.2.7). Some respondents indicated the existence of the learning support guidelines, which do not include ICTs, and the ICT policy that does not include the learning support.

It was evident from the empirical findings that SBSTs and LSEs mostly use the learning support guidelines that are stipulated in Sections 7 and 8 of the Guidelines for FSS to support learners experiencing reading difficulties. The conclusion made from these findings was that there are no guidelines specifically for using ICTs to support learners experiencing reading difficulties and these calls for the ICTs guidelines to be developed which is done in this study (below).

To answer the third research question (Section 1.5) and achieve the third objective (Section 1.6) of this study, guidelines need to be developed for using ICTs as a support mechanism for learners experiencing reading difficulties. The conclusion on the secondary research question 1 (Section 5.5.2) and the conclusion on the secondary research question 3 highlight the need for guidelines in order to identify learners who are experiencing reading difficulties and provide them with appropriate ICTs support. Overall, this adds up to answering the main research question.

This study has focused on the learners experiencing reading difficulties in the intermediate phase (Grade 4-6) of the FSS. The main aim was to explore, describe and explain the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties in improving levels of academic achievement. Reading-screening reports, academic and reading progress reports were analysed to isolate and identify the effectiveness of ICTs for supporting learners experiencing reading difficulties as compared to other support mechanisms. The corroboration of the QUAL findings (Tables 4.9 and 4.10) with the QUAN findings (Table 4.23) prove

the relative effectiveness of the use of ICTs in supporting learners experiencing reading difficulties for improving academic achievement.

Lastly, taking into consideration the findings presented in chapter 4 and the summary of the merged findings in this chapter, it can be concluded that they support the null hypothesis (H_{0m}) formulated in chapter 1.

H_{0m} : There is no statistically significant difference in the reading performance of participants who were exposed to ICTs as a support mechanism to support learners experiencing reading difficulties in FSS.

as opposed to the alternative hypothesis:

H_{1m} : There is a statistically significant difference in the reading performance of participants who were exposed to ICTs as a support mechanism to support learners experiencing reading difficulties in FSS.

From the interpretation of results in section 4.4.2.3, it can be concluded that there is a statistically significant difference in the reading performance of learners who were exposed to ICTs as a support mechanism for learners experiencing reading difficulties in the FSS. However, there is only a slight improvement in performance, which can be attributed to lack of ICTs guidelines for supporting learners experiencing reading difficulties and the limited use of the ICTs support.

That brings me to the recommendations of this study which are based on the above summary of findings and conclusions.

5.7 RECOMMENDATIONS

The recommendations proposed in this section lean primarily on the ZPD part of Vygotsky's sociocultural theory, which has been the central theory that formed part of the theoretical framework of this study. It was highlighted in the literature review (Section 2.8) that the ZPD serves as the common denominator between the three theories that form part of the theoretical framework that underpin this study. The main focus of this study, namely the ZPD which has a scaffolding component of the cognitive apprenticeship model of instruction was discussed in chapter 1 and chapter 2 of this study.

The recommendations below are presented on three levels, namely, departmental level, school level and SBST level. As indicated in chapter 1, this study took place in 5 FSSs within one District in Gauteng. The first recommendation is directed to the District office as the representative of the Department of Education and as the most authoritative level in relation to this study. The second recommendation is directed to the FSS while the third and final recommendations are for the SBSTs and the LSEs.

5.7.1 Recommendations to the Department of Education

The Department of Education established Guidelines for FSS in 2009, which mandate the provision of support; however, they do not include specific support for learners experiencing reading difficulties.

Recommendation 1: Guidelines for FSS (2009) should be reviewed to include clear and specific roles of SBSTs and LSEs in supporting learners experiencing reading difficulties. Part of the guidelines should include an ICTs guideline to guide teachers in the support of learners experiencing reading difficulties – if it is expected of all teachers to be capable of supporting learners experiencing reading difficulties.

Recommendation 2: From the information gathered in the literature review and the findings presented in chapter 4, it is apparent that many teachers do not know how to teach reading properly, let alone support learners experiencing reading difficulties. The Department should liaise with the institutions of higher learning (Colleges and Universities) to include ICTs literacy and reading support training for prospective teachers.

5.7.2 Recommendations to the full-service schools

The effectiveness of the use of ICTs for supporting learners experiencing reading difficulties presented in section 5.4.2, has raised important implications, namely, limited ICTs and a need for teacher training with regard to the use of ICTs in supporting learners experiencing reading difficulties.

Recommendation 3: It is imperative that the FSS include the procurement of ICTs as part of their Learning Teaching and Support Material³¹ in their budget.

³¹ Learning Teaching and Support Material is a broad term, which is used to denote a variety of material used by teachers and learners for development, and a means of promoting both teaching and learning in schools (Mpumalanga Education Department, 2011: 3).

5.7.3 Recommendations to the SBST and LSEs

It was clear from the focus group interviews that most of the FSSs did not have guidelines for supporting learners experiencing reading difficulties by using ICTs (Section 4.3.2.7). Those FSSs who claimed to have guidelines confirmed they only use them to access the ICTs as part of managing the inventory of the school.

Recommendation 4: The SBSTs and LSEs should collaborate with other FSSs, the DBSTs, reading and ICT experts (for example, from non-governmental organisations) and institutions of higher education to establish committees that would undertake activities such as adapting the ICTs guidelines to suit the context of their schools and the available ICTs infrastructure supplied by the Department.

5.8 SUGGESTED GUIDELINES FOR USING ICTs AS A SUPPORT MECHANISM FOR LEARNERS EXPERIENCING READING DIFFICULTIES

This section of the study answers the last secondary research question: *what guidelines can be developed for ICT learner support for learners experiencing reading difficulties in FSS?* The guidelines I suggest incorporate social interaction as part of Vygotsky's sociocultural theory (Section 2.8.1); the four steps of the Readers-response theory (Section 2.8.2) and the electronic text as part of the e-Reading theory (Section 2.8.3).

It was indicated in chapter 1 (Section 1.11) that ICTs include communication devices or applications, including radio, television, cellular phone, computer and network hardware and software, satellite systems as well as services and other applications associated with them such as video-conferencing. In these guidelines, the following ICTs devices are recommended because they are the basics required for making lessons possible, and the Department supplies the schools with most of them: computer, television, play station, tablet, laptop, cellular phone, and voice and video recorder. The software I recommend includes computer-assisted instruction, which comprises of tutorials, drill-and-practice, simulation, instructional games and tests; Microsoft reader; text-to-speech software and speed-reading software. These recommended software programmes are specifically adapted for reading, meaning that they are relevant to support reading difficulties; however, their effectiveness can only be evaluated when they are used.

Against this background, the suggested guidelines are titled: *The ICTs scaffolding guidelines for supporting learners experiencing reading difficulties*. The guidelines are divided into three steps, namely: Step 1: teacher guidance and introduction to the reading activity; Step 2: support; and Step 3: assessment. These steps are described in detail below. These ICTs scaffolding guidelines resonate with the constructivism paradigm used in this study. The guidelines promote constructivism learning as they help learners internalise and transform new information into knowledge.

5.9 A FRAMEWORK FOR THE DESIGN OF AN ICTs GUIDELINE

Using the findings-discussion in section 5.4.1 to 5.4.3 and the recommendations in section 5.6, as well as Vygotsky's sociocultural theory discussed in section 2.8.1 (specifically the ZPD), the following framework has been used in the development of the ICT guideline (that will form part of a Department of Education policy document available at schools) that is presented in section 5.8.3 of this thesis. The framework is presented visually by Figure 5.1. This figure should be interpreted in relation to Figure 1.3 and 2.7 respectively. Figure 1.3 and 2.7 illustrate the relationship between the three theories that form the theoretical framework that underpins this study. The theoretical framework in the design on the ICT guidelines played a crucial role because the common concept that linked the three theories (scaffolding) informed the design and the implementation of the guideline. The visual overview of the guideline is illustrated by Figure 5.1.

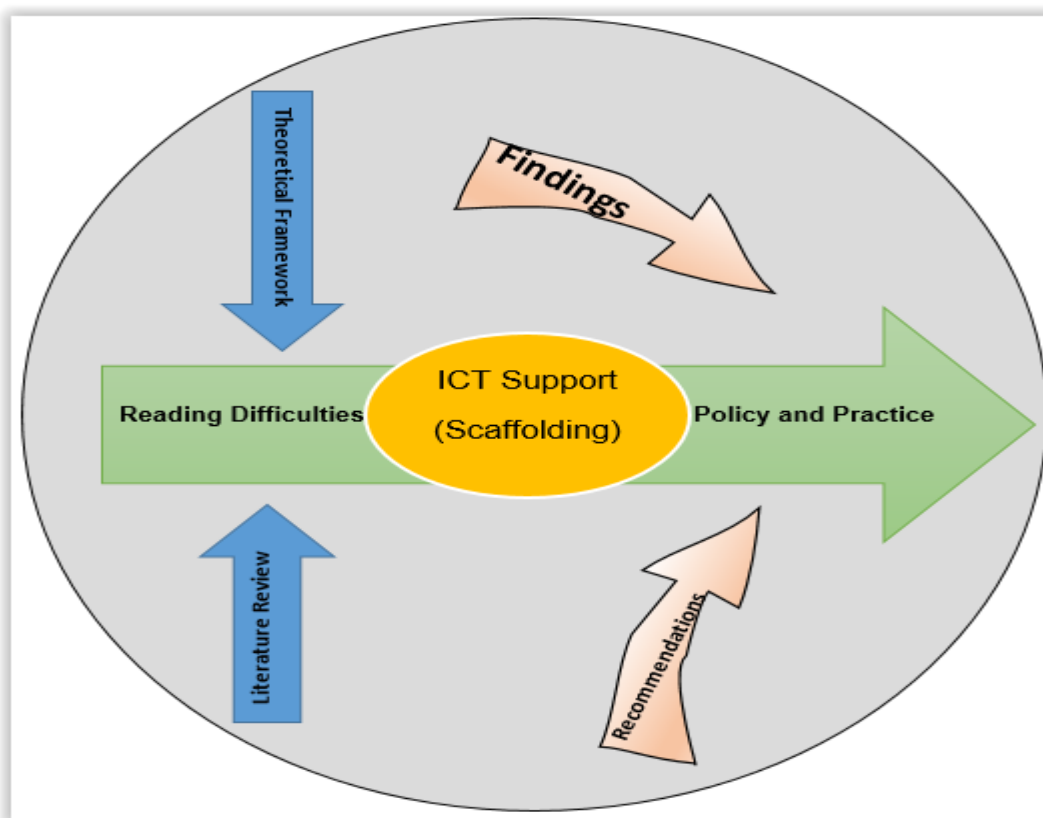


Figure 5.1: Visual overview of the framework for the design of an ICT guideline

From the data in Figure 5.1, theoretical framework and literature review are pointing at the reading difficulties. The essence of that indication is that, from the theoretical framework and literature review, the ICTs support which have the element of scaffolding was discovered. The findings and the recommendations are pointing at policy and practice which signifies that the contributions drawn from the findings and the recommendations helped to structure the ICTs guideline in a manner that may potentially inform policy (ICTs policy and e-education policy) and practice (implementation in all the schools).

5.9.1 Framework for the ICTs guideline

The framework as illustrated in Figure 5.1 for the ICT guidelines suggested:

- The support of learners in general, defined in the school context to distinguish support from teaching duties of teachers;
- The definition of reading difficulties and types of reading difficulties;

- The definition of ICTs and the types of ICTs and their general application area when it comes to reading and reading difficulties; and
- The use of ICTs to identify learners' reading levels (which ICTs applications and ICTs-modality apply).

5.9.2 Theory underlying the suggested the ICTs-guideline

The theory underlying these suggested guidelines is one of the theories that form part of the theoretical framework that underpins this study (Vygotsky's sociocultural theory) with the focus on the ZPD. These guidelines link well with ZPD as highlighted above in the sense that they offer the potential for cognitive development, which is limited to a certain range and is unique to each individual.

During the second and the third steps of these guidelines, the ZPD is more evident, the reason being that the support process determines the range between the actual developmental level of intelligence of the learner (without guided instruction) and potential intelligence (determined by problem-solving abilities under the guidance of assistants or more capable peers). The ICTs scaffolding guidelines are illustrated in Figure 5.2, which is described in detail thereafter.

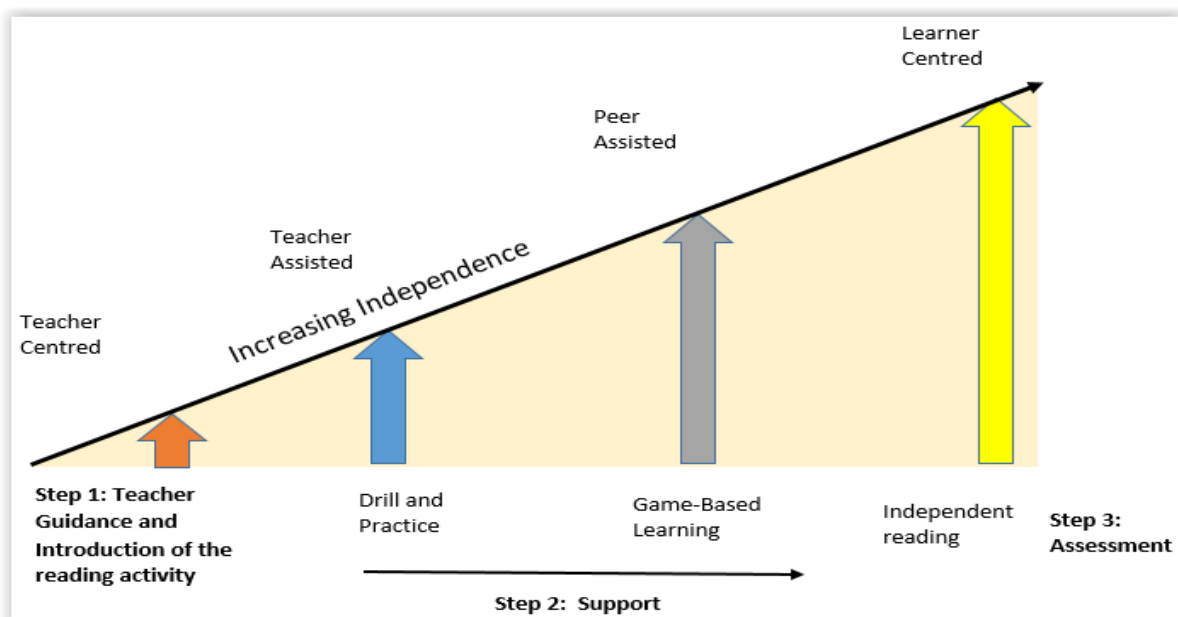


Figure 5.2: The ICTs scaffolding guidelines

5.9.3 The ICTs-guidelines

It should be noted that the ICTs scaffolding guidelines illustrated in Figure 5.2 aim to help teachers in using ICTs scaffolds to support learners experiencing reading difficulties.

It should be noted that the ICTs scaffolding guidelines illustrated in Figure 5.2 above aim to help teachers in using ICTs scaffolds to support learners experiencing reading difficulties. Teachers can also use these guidelines within the context of their schools (such as the availability of ICTs infrastructure). The guidelines should be incorporated into the lesson preparation. Firstly, the teacher should screen the learners using any of the screening tools discussed in Section 2.6 to identify specific reading difficulties the learner is experiencing, the reading stage the learner is at and the prerequisites for reading that the learner has not acquired.

Table 5.1 illustrates some information taken out of one of the screening reports (Appendix F) for L56 from School C, which was done by an electronic Informal Reading Inventory which was explained in Section 2.6 of chapter 2. The screening is done online, and, as a result, the percentages are auto-generated when the learner is being screened.

Table 5.1: An extract from L56's screening report

Components of Reading	What was assessed	Learner's level of competency
Alphabetic principle	Recognition of letter of alphabet	57%
Phonics	Basic literacy awareness: identification of the initial letter in response to hearing a word	38%
Syllables	Breaking words into sound chunks smaller than the whole word	15%
Reading vocabulary	Reading a series of words and identifying which most closely matches the picture	47%
Spelling non-words	The learner was played a novel non-word and asked to spell it	9%
Spelling words	Spelling ability	7%

It is apparent from Table 5.1 that L56 from School C can recognise 57% of the letters of the alphabet and has the most difficulty with spelling for both words and non-words. Supporting L56 using the *ICTs scaffolding guidelines for supporting learners*

experiencing reading difficulties, the teacher should prioritise the components with the lowest percentages not neglecting support for all the remaining components.

The teacher should decide which ICTs devices and software are required for the reading-support lessons for L56. For example, the basics that can be required are: a laptop or a desktop computer for the teacher to give instructions or demonstrations; a data projector or interactive smart board or TV or LCD screen to project the lesson activities; software such as text-to-speech (for example, if the lesson activity is about spelling or sounding) or speed-reading software (if the lesson activity is about fluency and speed) and the learner's tablet or computer. The ICTs guidelines depicted in Figure 5.1 are outlined in the following three steps below:

5.9.4 Step 1: Teacher guidance and introduction to the reading activity

Step 1 is a teacher centered process that involves preparation of the learning environment, i.e. putting in place the required ICTs as in the example above. If the internet connectivity is required, to make sure that there is connectivity; if there will be a use of sound, to make sure that the speakers are working or the sound is at the correct level and to also make sure that every learner has the relevant activity. In other words, every learner should have the activity suitable for that learner's reading stage for the individual activities, while for the group activities, the learners in a group should be at the same reading stage.

During this step, the teacher should introduce the lesson, set the learning goal together with the learners, and explain the ICTs devices that are going to be used for each activity in the lesson. At the same time, the teacher should check with the learners if they are able to use the ICTs and demonstrate how they should do the activities. For example, if the learning goal is to recognise 10 words that are projected on the data projector or interactive smart board within 5 minutes. Then, there should be an indication of the next step. For the learner, the next step can be an activity, such as matching the identified words with the pictures by using their tablets or computers by dragging a word and dropping it next to the picture or vice versa. In this step, the teacher is always at the side of the learner guiding and demonstrating where possible as shown in Figure 5.3.



Figure 5.3: Teacher support during the activity

Source: Taken by the researcher during a reading-support session in the FSS classroom

Figure 5.3 illustrates group work, where the teacher is constantly supporting the learners while they are busy with the activity. This illustration links with the illustration of Figure 2.6 where the teacher's support keeps the learner within the ZPD.

5.9.5 Step 2: Support

As illustrated in Figure 5.3, step 2 involves a teacher and a learner where the teacher assists the learner through drill-and-practice until the learning goal is achieved. For example, if the learning goal is word recognition, the words will be projected repeatedly for the learner until the learner is able to recognise 10 words within 5 minutes. The teacher is also assigning new tasks as the learner completes the given ones, increasing the level of difficulty when there is evidence of progression, and providing feedback as illustrated in Figure 5.3.

As shown in Figure 5.3, this process will also increase the learner's level of independence. To give an example of increasing the level of difficulty still using the example of word recognition, the first level of activity might include the text-to-speech option where the words chosen are read back to the learner. To increase the level of

difficulty, the teacher can switch off the text-to-speech option when the learner is matching the words with the pictures. The learner can be asked to read the words after matching them with the pictures. Since the activity was given a quantified learning goal (recognition of 10 words) and a timeframe (5 minutes), the teacher should keep record and score of the activity. The learner should be given continuous feedback as the level of difficulty is changed. The record of the scores and the level of difficulty the learner has reached should be used as a baseline for the next activity.

During the second part of step 2, where the peer assists the learner in a Game-Based Learning (GBL) activity the focus is on limited vocabulary, difficulties with spelling, comprehension and fluency. The GBL is a learning activity through play where learners mostly concentrate on the game goal and the game reward while indirectly achieving the learning goal. In these guidelines, with the focus on ICTs, a Digital Game-Based Learning (DGBL) is recommended. Examples of DGBL are instructional acts where instructors reference digital games to teach concepts, theories, system-thinking, design-thinking, and participatory acts where learners play games and create digital game systems for experiential learning (Petrina, 2007: 251). Figure 5.3 below is the illustration of participatory act of DGBL.



Figure 5.4: Example of a digital game-based learning activity

Source: Educationcurb.com (2017:3)

This picture was taken from a computer screen, and, as can be seen, there are buttons for forward, rewind, information, time, score and the type of activity (play a word or play a sentence on the far-right corner of the screen). The learner can choose to play a word or a sentence. This game can be played on the following ICTs devices: a computer or a laptop, a tablet or interactive smart board. This part of learning links well with the ZPD as learners feel more confident in playing with a peer long before the game declares them competent. Once declared competent, the game offers more advanced content at a higher level of play which learners attempt with (or without) a peer. Vygotsky (1978a:59) emphasises that in play, learners generally perform beyond their developmental level.

During the DGBL, the learner/s can work in pairs although the activities can be extended to small groups of learners. Referring back to the example of word recognition, learners can have dual shockers that are used for PlayStation, or they use computer keyboards to compete in identifying 10 words within 5 minutes, projecting the game on the TV screen or interactive smart board or a computer screen. Other learners can play the role of timekeeper, umpire (to avoid cheating) and scorekeeper. There should be an exchange of roles until all the learners have participated in each role assigned in the activity.

As mentioned above, the DGBL activities can address different types of reading difficulties simultaneously while the teacher can set up different pairs or small groups of learners to play for different outcomes and rotate as they complete the games. For example, if the classroom has 30 learners there could be six groups of five learners each. Group 1 and 2 can play a vocabulary game, group 3 and 4 play a spelling game and group 5 and 6 play a vocabulary game. The groups can exchange until each group has done all the activities. During this exercise, the teacher can further identify other aspects of reading difficulties the learners are experiencing.

It should also be noted that the levels of difficulty for the game should always be increased when the activities have been completed. The most important aspect is that there should be game rewards that are offered such as accumulating points that score a learner's position of either being the first to start next time or to choose the favourite story to read. It does not mean that the teacher has no role in this step. The teacher's role is continuous assessment in the form of observation and using the game scores

as well so that the learner can be moved from one reading stage to the next. At the same time, the teacher is able to identify the acquired prerequisites for reading (Section 2.2.2) while the learners are playing the reading games.

5.9.6 Step 3: Assessment

Step 3 serves as the final step of the guidelines and, as illustrated in Figure 5.2, it is a learner-centered process where the learner is reading independently without any assistance. It is apparent from step 1 that independence increases as the learner is assisted by the teacher and the peer. The assessment can be done onsite or online. It is recommended that teachers should consider assessments that include measuring the reading level/ability against the grade level. The assessment should also be categorised into identification of difficulties, formative and summative. At the end of the assessment process, if the learner has mastered the reading stage, there could still be some aspects that need improvement, in which case the steps can be followed again from the beginning.

Referring to Table 5.1 above, if the learner's spelling ability improves from 7% to 30%, it will be advisable for the teacher to start from step 1 but with an increased level of difficulty. From the given examples, it can be noted that frequent use of the scaffolding guidelines during reading support of learners experiencing reading difficulties might:

- improve their reading speed (due to the timed activities);
- improve their comprehension and vocabulary (because of drill-and-practice activities);
- learn to be goal oriented; and
- improve their audio and visual memory (ICTs are audiovisual resources).

Based on the premise that the scaffolding guidelines will address the learners' reading difficulties, it will also improve the learners' confidence and develop their study skills which in turn will have a positive effect on their academic performance on some or all of the subjects.

5.10 RECOMMENDATIONS FOR FURTHER RESEARCH

Findings from this study and the suggested ICTs scaffolding guidelines pointed towards the following new priorities and avenues for research:

- A longitudinal study is recommended using the suggested ICTs scaffolding guidelines to track the progress and academic achievement of learners experiencing reading difficulties. The study should at least be conducted for a three-year period because, at the end of three years, learners will be completing a phase and sufficient data would have been collected to generalise the findings.
- Further research is also required to explore the use of ICTs scaffolding guidelines for the reading of Home Language.

5.11 CONCLUDING REMARKS

This study has been a journey that closed a personal preconception gap, and it was a learning experience that highlighted the importance of acknowledging the possible contributing factors for reading difficulties. The success of the support mechanism relies on uprooting the difficulty, hence the importance of screening and identification.

This chapter ends this study on the note that findings from the literature were explored through empirical investigation and the objectives set in chapter 1 were met. The main aim of this study was achieved, the hypothesis accepted and the research questions answered in anticipation of the acceptance of the recommended guidelines, prompting further research, which will recognise the formulation of a model or framework for ICTs as a support mechanism for learners experiencing reading difficulties.

The identified types of reading difficulties from the literature and empirical investigation revealed that every learner might experience reading difficulties in a unique way that can also impact on the academic achievement if not well supported. The support systems in the FSS might provide additional help to address the implications of behavioural or psychosocial problems.

One more interesting observation made about learners receiving support through ICTs as support mechanism is the development of interest in their studies, improvement of self-esteem and self-fulfilment when reaching the independent stage of reading. The last point to be made is the anticipation of a positive contribution of the recommended guidelines towards the ICT support of learners experiencing reading difficulties.

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APPENDICES

APPENDIX A: LIST OF THE SBST MEMBERS

Name of the school: School A

Name of the SBST member	Designation
SBST 1	SBST Coordinator
SBST 2	Scribe
SBST 3	Mathematics representative
SBST 4	Language representative
SBST 5	Sport representative
SBST 6	School assessment representative
SBST 7	School admissions representative
SBST 8	Learning and Teaching Support Material committee representative
SBST 9	Condolence committee representative
SBST 10	Special Concessions coordinator
SBST 11	Safety representative
SBST 12	Psychosocial support representative
SBST 13	School health and nutrition representative
SBST 14	Grade 1 representative
SBST 15	Grade 2 representative
SBST 16	Grade 3 representative
SBST 17	Grade 4 representative
SBST 18	Grade 5 representative
SBST 19	Grade 6 representative
SBST 20	Grade 7 representative

APPENDIX B: THE FINAL SAMPLE

Selected participant	Allocated pseudonym
SBST 1	Teacher A
SBST4	Teacher B
SBST 6	Teacher C
SBST 14	Teacher D
SBST 15	Teacher E
SBST 16	Teacher F
SBST 17	Teacher G
SBST 18	Teacher H
SBST 19	Teacher I
SBST 20	Teacher J

APPENDIX C: THE STRUCTURED QUESTIONNAIRE

Questionnaire to be completed by the SBST members and LSEs

Information Communication Technologies as a support mechanism for learners experiencing reading difficulties in Full Service Schools:

Questionnaire

Dear Sir/Madam

The aim of the questionnaire is to explore the perceptions of SBST members and LSEs regarding the use of ICTs in supporting learners experiencing reading difficulties and determining the effects of ICTs as a support mechanism on learners experiencing reading difficulties. The results of the study will be used to develop the guidelines/framework that could enhance or promote the use ICTs as a support mechanism for learners experiencing reading difficulties.

Your participation in the study will be greatly appreciated. However, the participation is voluntary. During the data collection process, you are encouraged to keep your anonymity and those of others when answering the questions. The information collected will be treated with confidentiality.

INSTRUCTIONS

1. Kindly respond to all questions.
2. The questionnaire consists of eleven sections. Please answer all the sections.
3. Please indicate your response with a "X" in the appropriate box.
4. Please select one option.

Thank you for participating.

Researcher:

Mphahlele R.S.S

Email: shilamass29@gmail.com

Cell No: 073 898 7987

Department of Psychology of Education

College of Education

Supervisor:

Prof NM Nel

Email: tneInm@unisa.ac.za

Cell no.: 083 660 9219

For official purposes

1-3

**A SECTION A:
BIOGRAPHICAL DATA**

1	Designation	SBST	1	LSE	2
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4 1

2	Gender	Female	1	male	2
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3	How old are you?				

5

4	Post level (Teacher =1; HOD = 2; Deputy Principal = 3; Principal = 4)	1	2	3	4
---	---	---	---	---	---

6

5	Professional qualifications Please specify if marked Other: _____	3 yr	4yr Degree e/Deg+Di pl	BEd Hons.	Masters Degree	
		1	2	3	4	5

7

6	How many years of teaching experience do you have?				

8

7	How many periods do you have per week?				

9

8	Number of workshops/training attended in ICT over the last three years	0	1	2	3	4 +
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10

9	School locality	Township	Town/City	Village	Farm	1	<input type="checkbox"/>
		1	2	3	5	2	
10	Number of learners experiencing reading difficulties in the school						

SECTION B: In this section, we'd like to explore your perceptions in relation to the use of ICTs as a support mechanism for learners experiencing reading difficulties

A POSSIBLE CONTRIBUTING FACTORS OF READING DIFFICULTIES

Use the scale provided below to answer A to D:

Indicate the percentage of learners experiencing reading difficulties in your schools who are affected by the following possible contributing factors:

1 – 0-20 %

2 - 21-40 %

3 - 41-60%

4 - 61-80%

5 - 81 -100%

		1	2	3	4	5		
1	Intellectual factors						13	<input type="checkbox"/>
2	language problems						14	<input type="checkbox"/>
3	learning factors						15	<input type="checkbox"/>
4	Physical/medical factors						16	<input type="checkbox"/>
5	Hearing problems						17	<input type="checkbox"/>
6	Visual problems						18	<input type="checkbox"/>
7	Socio-economic problems						19	<input type="checkbox"/>
8	Social problems						20	<input type="checkbox"/>
9	Cultural problems						21	<input type="checkbox"/>
10	Hereditary factors						22	<input type="checkbox"/>
							23	<input type="checkbox"/>

B IMPLICATIONS OF READING DIFFICULTIES

Indicate the percentage of learners affected by the following effects of reading difficulties

		1	2	3	4	5		
1	Low rate of comprehension						24	<input type="checkbox"/>
2	Low rate of retention						25	<input type="checkbox"/>
3	Poor word recognition						26	<input type="checkbox"/>
4	Limited vocabulary						27	<input type="checkbox"/>
5	Difficulty decoding phonics						28	<input type="checkbox"/>
6	Poor structural analysis						29	<input type="checkbox"/>
7	Lack of fluency skills						30	<input type="checkbox"/>

8	Bad spelling						31	
9	Poor self-esteem						32	
10	Behavioural problems						33	

C TRENDS FOR READING

DIFFICULTIES

Indicate the percentage of learners who tend to:

		1	2	3	4	5		
1	experience difficulties in adapting from their Home Languages to First Additional Language						34	
2	Drop out of school						35	
3	Engage in criminal activities						36	
4	Be less active in community activities						37	
5	Be emotionally drained						38	
6	Experience behavioural problems						39	
7	Fail most of the academic subjects						40	
8	Have low reasoning capacity						41	
9	Avoid reading activities						42	
10	Less motivated						43	

D SUPPORTING LEARNERS EXPERIENCING READING DIFFICULTIES

Indicate the percentage of learners who are on the following stage of reading

		1	2	3	4	5		
1	Emergent literacy						44	
2	Beginning reading						45	
3	Fledging reading						46	
4	Developing reading						47	
5	Mature reading						48	
6	Phonological awareness						49	
7	Phonemic awareness						50	
8	Vocabulary development						51	
9	Alphabetic principle						52	
10	Print knowledge						53	

E SCREENING TOOLS AND SUPPORT MECHANISMS

Use the frequency scale below to:

Indicate the level of usage of the following screening tools and support mechanisms

1 - Never

2 - Seldom

3 - Sometimes

4 - Often

5 - Very regularly

1	2	3	4	5
---	---	---	---	---

1	Informal reading inventories						54	
2	Norm reference tests						55	
3	Standard-based tests						56	
4	portfolios						57	
5	rubrics						58	
6	Response to intervention						59	
7	Language Experience approach						60	
8	Guided reading						61	
9	Integrated approach						62	
10	Information Communication Technologies						63	

AVAILABILITY OF ICTs

Use the scale below to indicate the availability of the following ICTs:

1 – insufficient

F 2 - somewhat Insufficient

3 - Average

4 - Somewhat sufficient

5 - Sufficient

		1	2	3	4	5		
1	Computers in a computer lab						64	
2	Learners tablets						65	
3	Teachers' software for supporting learners experiencing reading difficulties						66	
4	Reading support programmes/applications for learners						67	
5	e-readers						68	
6	digital reading-screening tools						69	
7	Teacher laptops						70	
8	Interactive Smart Boards						71	
9	Ear phones for learners						72	
10	Tape recorder						73	

G USING ICTs TO IDENTIFY LEARNERS EXPERIENCING READING DIFFICULTIES

Indicate the frequency-of-use of ICTs for the following:

1 – Never

2 - Seldom

3 - Moderate

4 - Often

5 - Frequently

		1	2	3	4	5		
1	Downloading of pre-loaded reading-screening tools relevant for identifying learners experiencing reading difficulties						74	

2	Selecting of relevant screening tools for the different reading difficulties						75	
3	Designing reading-screening tools for identifying the types of reading difficulties experienced by learners						76	
4	Uploading and saving the designed reading-screening tools for future use						77	
5	for Identifying the reading levels of the learners						78	
6	Classification of learners according to their reading levels						79	
7	Identifying the relevant type of support needed by the identified learner						80	
8	Identifying the required level of support needed by the identified learner						81	

H UTILISATION OF THE ICTs FOR SUPPORTING LEARNERS EXPERIENCING READING DIFFICULTIES

Indicate the frequency of ICTs use for the following:

1 – Never

2 - Seldom

3 - Sometimes

4 - Often

5 - Very regularly

		1	2	3	4	5		
1	To browse/search internet to collect more information to prepare the reading-support lessons						82	
2	Downloading of pre-designed reading-support lessons						83	
3	Create my own digital reading-support lessons						84	
4	Designing of Individualized Support Plan (ISP) for each learner						85	
5	Updating and reviewing of ISP						86	
6	To prepare reading assessment tasks for the learners						87	
7	Evaluate the reading progress of the learners						88	
8	Record the learners' reading progress						89	
9	Provide online feedback and communicate with parents						90	
10	Retrieve and record parents' responses						91	

I EFFECTIVENESS OF ICTs IN ADDRESSING READING DIFFICULTIES

Indicate the level of ICTs effectiveness in relation to the following:

- 1 – Not at all effective
- 2 - Slightly effective
- 3 - Moderately effective
- 4 - Very effective
- 5 - Exceptionally effective

		1	2	3	4	5		
1	increase interaction between learners						92	
2	promotes learner independence						93	
3	improves learner word recognition ability						94	
4	improves the learners' ability to pronounce words correctly						95	
5	increase learners' vocabulary						96	
6	enhance learner' comprehension skills						97	
7	improves learner's reading fluency						98	
8	helps learners to grasp the reading skills in a short space of time						99	
9	improves the overall performance of the leaners in most of the school subjects						100	
10	Enables the teacher to set high expectations for learners experiencing reading difficulties						101	

J TEACHER TRAINING WITH REGARDS TO THE USE OF ICTs TO SUPPORT LEARNERS EXPERIENCING READING DIFFICULTIES

Indicate the level of training you require when performing the following:

- 1- No training
- 2 - Some training
- 3 - An average level of training
- 4 - Quite a lot of training
- 5 - A very high level of training

		1	2	3	4	5		
1	To browse/search internet to collect more information to prepare the reading-support lessons						102	
2	Downloading of pre-designed reading-support lessons						103	
3	Create my own digital reading-support lessons						104	
4	Designing of Individualized Support Plan (ISP) for each learner						105	
5	Updating and reviewing of ISP						106	

6	To prepare reading assessment tasks for the learners						107	
7	Evaluate the reading progress of the learners						108	
8	Record the learners' reading progress						109	
9	Provide online feedback and communicate with parents						111	
10	Retrieve and record parents' responses						112	

Section C: General

Indicate the following (in your school)

Pockets of excellence in relation to the use of ICTs for supporting learners experiencing reading difficulties:

Challenges experienced when using ICTs for supporting learners experiencing reading difficulties:

Training needs regarding the use of ICTs when supporting learners experiencing reading difficulties:

Thank you

APPENDIX D: STRUCTURED OBSERVATION CHECKLIST

Structured Observation Checklist

Structured Observation Checklist for the available ICTs for supporting learners experiencing reading difficulties

Name of School: _____ Observation date: _____

Name of observer: _____ Time: _____

ICTs	Available	Not available	Comments
TEACHING AND LEARNING ICTSs			
Computers/Laptops for teachers			
Interactive Smart board			
Data projector			
e-beam			
TV			
Computers/Tablets for learners			
Earphones for learners			
Tape recorder			
RESOURCES			
Internet			
Wi-Fi			
Reading games			
Reading apps for learners			
Reading software for teachers			
Digital Reading-screening tools			
e-books			
e-readers			

APPENDIX E: FOCUS GROUP INTERVIEW SCHEDULE

Interview Schedule for Focus Group Interviews

1. What are the most contributing factors of reading difficulties in your school?
2. What are the common types of reading difficulties experienced by the learners at your school?
3. From your observations in the classroom, what are common effects of reading difficulties in your learners?
4. How do you identify learners experiencing reading difficulties?
5. How do you support learners experiencing reading difficulties in your school?
6. What types of ICTs are [Online]. Available at your school to support learners experiencing reading difficulties?
7. Which ICTs do you find most effective in supporting learners experiencing reading difficulties?
8. Can you elaborate on their effectiveness?
9. Do you have any policy/guideline/framework that guides you when using ICTs to support learners experiencing reading difficulties?
10. What impact does the policy/guidelines/framework on using ICTs for supporting learners experiencing reading difficulties have in the school?

APPENDIX F: OFFICIAL REPORTS

Reading-screening report

Individual Report Teacher Copy

Do-IT>
Profile

Personal Details

Name: Learner 92
Date Completed: 09/05/2015 13:06:45

Region: Tahwene South District
School: School D
Class: Grade 6
Sub Class: Teacher F

Summary

Below is a summary of tasks undertaken and the information gathered in Do-IT Profile. Where tasks have been completed an evaluation has been provided. Implications and recommendations are provided on the following pages. Please remember, the information in the report is based on the responses you have given.

Key

- | | |
|--|------------------------------------|
| ① Significant challenges reported | ② Many challenges reported |
| ③ Reasonable skills - no action required | ④ Good skills - no action required |
| ✓ Completed | ✗ Not completed |

Modules

Colours	④ No difficulties were identified.
Language of Placement	① Some difficulties were identified
Odd One Out	② Some difficulties were identified. Visual skills should be monitored.
Alphabetic Principles	③ This checks sound-letter correspondence. The individual had a few challenges with this task.
Phonics	① Significant difficulties were identified. Progress in letter and word knowledge should be checked.
Same Different	③ Some difficulties with this task have been identified - monitoring this would be advised.
Literacy and Numeracy	① Significant difficulties were identified.
Syllables	① Significant difficulties identified with the syllabification task. Appropriate support should be provided.
Rhyming	④ No difficulties were identified.
First sound	① Significant difficulties identified. This learner has difficulties with the alliteration / first sound task. Appropriate alliteration-based support should be provided.
Word Choice	③ Some difficulties were identified. Progress in sight word reading should be reviewed.
Word Choice 2	③ Reasonable skills - no further action
Reading Vocabulary	② Some difficulties with this task were identified - assistance may be required.
Spelling	
Spelling - Words	① Significant difficulties were identified. A closer analysis of the spelling errors should be made.
Spelling - Non-words	① Significant difficulties were identified. A closer analysis of the spelling errors should be made.
Maths - Foundations	② Difficulties with basic number concepts were identified.

Academic report



School A, 022

012-3037895

012-3037895

LEERDER: Learner 121

Totale punte: 300

Skooljaar: 2017/2018

Resultaat: 100%

Skooljaar: 2017/2018

Skooljaar: 2017/2018

Skooljaar: 2017/2018

Vak

Huidige leerjaar

Algemeen kennisvlak

Algemeen kennisvlak

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APPENDIX G: UNISA RESEARCH ETHICS COMMITTEE APPROVAL LETTER



UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2017/04/12

Ref: **2017/04/12/33130930/19/MC**

Name: Ms RSS Mphahlele

Student: 33130930

Dear Ms Mphahlele,

Decision: Ethics Approval from
2017/04/12 to 2019/04/12

Researcher:

Name: Ms RSS Mphahlele

Email: 33130930@mylife.unisa.ac.za

Telephone: 0738987987

Supervisor:

Name: Prof NM Nel

Email: tnelnm@unisa.ac.za

Telephone: 0836609219

Title of research:

**Information Communication Technologies as a support mechanism for learners
experiencing reading difficulties in Full Service Schools**

Qualification: D Ed In Psychology of Education

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2017/04/12 to 2019/04/12.

The low risk application was reviewed by the Ethics Review Committee on 2017/04/12 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.



University of South Africa
Pretoria Campus, Mafikeng, Rustenburg, Polokwane
PO Box 392 UNISA 0003 South Africa
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APPENDIX H: GDE PERMISSION LETTER



GAUTENG PROVINCE

Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	29 March 2017
Validity of Research Approval:	06 February 2017 – 29 September 2017 2017/53
Name of Researcher:	Mphahlele R.S.S
Address of Researcher:	135 Phudufufu Street Atteridgeville 0008
Telephone Number:	011 355 0964 073 898 7987
Email address:	shilamase29@gmail.com
Research Topic:	Information Communication Technologies as a support mechanism for learners experiencing reading difficulties in Full Service Schools
Number and type of schools:	Five Primary Schools
Districts/HO	Ekurhuleni South

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

Handwritten signature and date: 29/03/2017

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

Making education a societal priority

Office of the Director: Education Research and Knowledge Management


7th Floor, 17 Simmonds Street, Johannesburg, 2001

Tel: (011) 355 0488


Email: Perit.Yeshaba.sta@gauteng.gov.za

Website: www.education.gpe.gov.za

APPENDIX I: PRINCIPAL'S APPROVAL


UNISA
University of South Africa

this matter will be highly appreciated. Please do not hesitate to contact me or my supervisor for any clarity regarding this study.

Yours Sincerely






Ms Shila Mphahlele
Email: shilamass29@gmail.com
073 898 7987

Supervisor:
Prof NM Nel
Email: tnelnm@unisa.ac.za
Cell no.: 083 660 9219


✂

WRITTEN PERMISSION

I the principal of have read this letter which requests my permission for SBST members and LSEs in my school to be part of this study. I have understood the information about the study and I know what is expected of the participants. I am willing to allow the participants to be part of this study. I am also giving permission to the SBST Coordinator to provide Ms Mphahlele (Researcher) with the reading screening test reports and academic progress reports for analysis. I am willing to assist with the distribution of the permission letters as well.

		DATE:
Principal's name (print)	Principal's signature	Date:
		DATE:
Ms Shila Mphahlele	Researcher's signature:	Date

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University of South Africa
Pretorius Street, Muckleneuk Ridge, City of Tshwane
PO Box 509 UNISA 0008 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4140
www.unisa.ac.za

APPENDIX J: COVERING LETTER

Letter for the SBST members and LSEs

135 Phudufufu Street
Atteridgeville
0008

Date

Dear Participant

Re: Information communication Technologies as a Support Mechanism for Learners Experiencing Reading Difficulties in Full Service Schools.

I am Shila Mphahlele, a student at UNISA registered for DEd (Psychology of Education) at UNISA and I intend doing research on ICTs as a support mechanism for learners experiencing reading difficulties in Full Service Schools. Prof N.M Nel, a Supervising Lecturer at UNISA, supervises this study. Permission was requested from the GDE Research Coordination Unit to conduct this study and from the Principal of your school (see attached approval letters).

The aim of the study is to explore the effectiveness of the use of ICTs as a support mechanism for learners experiencing reading difficulties in improving levels of academic achievement in FSS. In addition, I intend to develop guidelines/framework that could enhance or promote the use ICTs as a support mechanism for learners experiencing reading difficulties in FSS.

I am requesting permission for you to participate in this study regarding ICTs as a support mechanism for learners experiencing reading difficulties in your school. The decision to select you as a participant in this study is based on the premise that you as School-Based Support Team member or the Learning Support Educator are considered to have considerable amount of experience in supporting learners experiencing reading difficulties. Even though permission has been granted by your principal for me to conduct the study, it is however still your decision to volunteer to participate in this study.




Should you decide to voluntarily participate it will entail that you form part of the Focus Group interview to explore your perceptions regarding the use of ICTs for supporting learners experiencing reading difficulties. The interview will be arranged at a time

which is convenient for you and I request that it be digitally audio recorded. The interview will last for up to 45 minutes and will be recorded to ensure the accuracy of the data. The transcripts of the interview will be provided to you for verification. In addition, I would like you to complete the questionnaire which is aimed at determining the effects of ICTs as a support mechanism on learners experiencing reading difficulties. You will be under no obligation to continue with the process should you wish to withdraw from the research. This can be decided upon at any time. All information will be dealt with the utmost confidentiality and no names will be revealed. No compensation is provided and all data will be stored in a safe place.

The data collected for this study will only be used for the researcher's DEd degree and excerpts of the Focus Group interview recordings may be made part of the final research report, but under no circumstances will the schools' names or your name be included in the report. Feedback will be made available on request once the research study is approved. You are welcome to contact me or my supervisor for any clarity regarding this study.

.....
Ms Shila Mphahlele
Email: shilamass29@gmail.com
073 898 7987

APPENDIX K: TEACHER'S CONSENT FORM

<p>Yours sincerely</p> <p></p> <p>Ms Shila Mphahlele Email: shilamass79@gmail.com 073 898 7987</p>		<p>UNISA <small>University of South Africa</small></p>	
		<p><u>Supervisor:</u></p> <p>Prof NM Nel Email: tnelnm@unisa.ac.za Cell no.: 083 660 9219</p>	
<p><input checked="" type="checkbox"/> <u>WRITTEN CONSENT</u></p>			
<p>I, <u>Luzaan la Grange</u> have read this letter which requests my permission for me to be part of this study. I have understood the information about the study and I know what is expected of my participation. I am willing to take part in this study in the form of a Focus Group Interview.</p>			
<p><u>Luzaan la Grange</u> Participant's name (print)</p>	<p> Participant's signature</p>	<p><u>2/5/17</u> Date:</p>	
<p> Ms Shila Mphahlele Researcher</p>	<p>Date:</p>		
<p>© 2017 College of Education All rights reserved</p>			
<p>University of South Africa Pretorius Street, Muckleneuk Ridge, City of Tshwane PO Box 852 UNISA, 0003 South Africa Telephone: +27 12 429 3111 Fax: +27 429 12 429 6110 www.unisa.ac.za</p>			

APPENDIX L: PARENTS' CONSENT FORM

UNISA		University of South Africa
WRITTEN CONSENT		
<p>I have read this letter requesting my permission for my child <u>TSAKO G. BINGANE</u>'s reading screening tests results and academic progress reports to be given to Ms Shila Mphahlele for analysis. I have understood the information about the research and I know what is expected of me. I am granting permission for my son/daughter's reports to be given to Ms Shila Mphahlele</p>		
<u>G. BINGANE</u>	<u>[Signature]</u>	<u>23/04/2017</u>
Parent's name (print)	Parent's signature	Date:
<u>G. BINGANE</u>	<u>[Signature]</u>	<u>23/04/2017</u>
Parent's name (print)	Parent's signature	Date:
<u>[Signature]</u>	<u>19.04.2017</u>	
Ms Shila Mphahlele	Date:	
Researcher		

APPENDIX M: TRANSCRIPTS

711.0071

Q: Okay welcome colleagues to this focus group interview. As I indicated earlier my name is Shila, and then you are allocated names, for anonymity purposes, as teacher A, B, C, D, E, F. so I am just going to quickly start with the interview because of time constraints. The first question that I would like to ask you. Is that what are the most common contributing factors of reading difficulties in your school. You have learners in your school who are experiencing reading difficulties, isn't it?

R: Yes.

Q: So what do you think is the cause of those reading difficulties, what are the factors that are contributing towards that, towards your learners' experiencing reading difficulties? Teacher C?

R: I think the contributing factor is the illiterate parents, because once the parents are illiterate, for the little ones to be exposed to books, is through the inspiration from their parents, so they don't have any other person who is inspiring them to do what, to open the books or to do picture, whatsoever.

Q: Okay. And then teacher E?

R: I also think that social and cultural factors can contribute to this, because most of our teachers, see that most of the parents are illiterate, they are not educated. So our kids, they don't see that courage to study, they don't have motivation at home, so we as teachers, we are trying our best but if these learners, when they arrive at home, they do not do any revision, they will never master what you are teaching them.

Q: Okay. You mentioned social and cultural factors, can you elaborate on that?

R: Social factors, in the community that you are living in and then for culture factors, culture is something that you are used to do, it is like inheritance, like something that you used to do. These kids are not used to read, or someone is going to the library. To them it is something that is weird. They are not used to it, they are not used to this, in their mind, someone, it is only teachers who are allowed to study. Only those families, those rich.

Q: Wow.

R: I wonder upon this typical library, because really our kids are not using the libraries, they don't use the libraries, even if they are encouraged to go to the library, I can quote an from my previous The mobile library from the municipality used to come there, but it was not.

APPENDIX N: CODES, QUOTATIONS AND MEMOS

All objects sorted by creation date

HU: Coding working

File: [C:\Users\shila\Desktop\Coding working.hpr7]

Edited by: Super

Date/Time: 2017-08-16 22:44:48

Editing period : 51 days

First object created: 2017-06-24 20:06:28 (HU: Coding working)

Last object created: 2017-08-14 19:44:16 (Quotation: 5:85)

(2017-06-24 20:06:28) HU: Coding working

(2017-06-24 20:07:41) Primary Doc: P 1: School A.pdf {72}

(2017-06-24 20:08:45) Quotation: 1:1 illiterate parents (1:774-1:791)

(2017-06-24 20:08:45) Code: Contributing factors {51-0}

(2017-06-24 20:09:13) Quotation: 1:2 social and cultural factors (1:1103-1:1129)

(2017-06-24 20:09:41) Quotation: 1:3 they don't have motivation (1:1309-1:1334)

(2017-06-24 20:10:18) Quotation: 1:4 not using the libraries (1:2152-1:2176)

(2017-06-24 20:10:51) Quotation: 1:5 don't have enough support from.. (2:624-2:667)

(2017-06-24 20:11:22) Quotation: 1:6 they are orphans (2:1089-2:1104)

(2017-06-24 20:11:47) Quotation: 1:7 child lead families (2:1123-2:1141)

(2017-06-24 20:12:10) Quotation: 1:8 living alone (2:1533-2:1544)

(2017-06-24 20:13:08) Quotation: 1:9 read word by word (3:204-3:220)

(2017-06-24 20:13:08) Code: Types of reading difficulties {60-0}

(2017-06-24 20:13:22) Quotation: 1:10 insert their own letters (3:228-3:251)

(2017-06-24 20:13:31) Quotation: 1:11 omit the letters (3:259-3:276)

(2017-06-24 20:13:52) Quotation: 1:12 do not understand comprehensio..
(3:350-3:380)

(2017-06-24 20:14:12) Quotation: 1:13 language barrier (3:422-3:437)

(2017-06-24 20:15:20) Quotation: 1:14 I must stick to English, I mus.. (3:1260-3:1390)

(2017-06-24 20:15:55) Quotation: 1:15 no phonics at all (3:2008-3:2026)

(2017-06-24 20:17:22) Quotation: 1:16 to switch from Sepedi to Engli..
(4:1041-4:1148)

(2017-06-24 20:18:03) Quotation: 1:17 the teacher, who can be the ba..
(4:1625-4:1660)

(2017-06-24 20:18:48) Quotation: 1:18 pronunciation (4:1911-4:1923)

(2017-06-24 20:19:49) Quotation: 1:19 very limited vocabulary (5:604-5:626)

(2017-06-24 20:21:14) Quotation: 1:20 Comprehension (6:248-6:260)

(2017-06-24 20:21:51) Quotation: 1:21 disturbing classes (6:663-6:680)

(2017-06-24 20:21:51) Code: Effects of reading difficulties {46-0}

(2017-06-24 20:22:05) Quotation: 1:22 They are playing (6:720-6:735)

(2017-06-24 20:22:16) Quotation: 1:23 They get bored (6:758-6:771)

(2017-06-24 20:23:13) Quotation: 1:24 adapted the curriculum (6:1096-6:1117)

(2017-06-24 20:23:41) Code: Support strategies {53-0}

(2017-06-24 20:24:05) Quotation: 1:25 not preparing enough and not k..
(6:1297-6:1354)

(2017-06-24 20:24:28) Quotation: 1:26 the learner is reserved (6:1779-6:1801)

(2017-06-24 20:24:42) Quotation: 1:27 disturbing other learners (6:1956-6:1980)

(2017-06-24 20:24:53) Quotation: 1:28 not participating in class all.. (6:1819-6:1859)

(2017-06-24 20:25:02) Quotation: 1:29 always absent from school (6:1882-6:1906)

(2017-06-24 20:25:10) Quotation: 1:30 he doesn't enjoy the lessons. (6:1919-6:1947)

(2017-06-24 20:25:56) Quotation: 1:31 they go to the toilet just bef.. (7:31-7:138)

(2017-06-24 20:27:28) Code: Identifying learners experiencing reading difficulties {18-0}

(2017-06-24 20:27:28) Quotation: 1:32 I was screening the learners (7:1001-7:1028)

(2017-06-24 20:28:11) Quotation: 1:33 do a mental maths, at least fo.. (7:1753-7:1799)

(2017-06-24 20:28:29) Quotation: 1:34 I just do a random selection, .. (7:1870-7:1979)

(2017-06-24 20:28:49) Quotation: 1:35 I group them, and share readin..
(7:2194-7:2322)

(2017-06-24 20:29:52) Quotation: 1:36 I would ask them to read in th.. (8:258-8:374)

(2017-06-24 20:31:00) Quotation: 1:37 we use intervention, (8:970-8:989)

(2017-06-24 20:31:22) Quotation: 1:38 use visuals, you use pictures (8:1376-8:1404)

(2017-06-24 20:31:39) Quotation: 1:39 we use video (8:1505-8:1516)

(2017-06-24 20:32:33) Quotation: 1:40 we start by making sentence, u..
(8:1876-8:1977)

(2017-06-24 20:33:01) Quotation: 1:41 lower level question paper (9:221-9:246)

(2017-06-24 20:33:25) Quotation: 1:42 extra work. (9:671-9:681)

(2017-06-24 20:34:13) Quotation: 1:43 reinforce this but if I just w.. (9:1541-9:1605)

(2017-06-24 20:34:24) Quotation: 1:44 using pictures (9:1657-9:1670)

(2017-06-24 20:34:34) Quotation: 1:45 I will blend in pictures (9:1673-9:1696)

(2017-06-24 20:34:49) Quotation: 1:46 demonstration (9:1895-9:1907)

(2017-06-24 20:35:10) Quotation: 1:47 I will also use pictures (10:228-10:251)

(2017-06-24 20:35:48) Quotation: 1:48 we go outside and practice out.. (10:630-10:665)

(2017-06-24 20:36:09) Quotation: 1:49 I use practical examples, real.. (10:1124-10:1167)

(2017-06-24 20:36:20) Quotation: 1:50 practical demonstration (10:1547-10:1569)

(2017-06-24 20:37:08) Quotation: 1:51 put a the names on the table s.. (10:2322-10:2390)

(2017-06-24 20:37:28) Quotation: 1:52 dotted lines, I use the dots, .. (10:2559-11:93)

(2017-06-24 20:38:11) Quotation: 1:53 you take some beans, you put a.. (11:775-11:944)

(2017-06-24 20:38:50) Code: Available ICTs {22-0}

(2017-06-24 20:38:50) Quotation: 1:54 white boards, we have projecto.. (11:1448-11:1479)

(2017-06-24 20:38:58) Quotation: 1:55 computers (11:1503-11:1511)

(2017-06-24 20:39:16) Quotation: 1:56 Laptops (11:1563-11:1569)

(2017-06-24 20:39:44) Quotation: 1:57 they use the tablets (11:1659-11:1678)

(2017-06-24 20:39:53) Quotation: 1:58 televisions and radios (11:1748-11:1769)

(2017-06-24 20:40:15) Code: Most effective ICTs {30-0}

(2017-06-24 20:40:15) Quotation: 1:59 Computers (12:140-12:148)

(2017-06-24 20:40:42) Quotation: 1:60 projectors (12:648-12:657)

(2017-06-24 20:40:55) Quotation: 1:61 radio (12:1253-12:1257)

(2017-06-24 20:41:12) Quotation: 1:62 tape recorder (12:1371-12:1383)

(2017-06-24 20:42:44) Code: Guidelines {9-0}

(2017-06-24 20:42:44) Quotation: 1:63 but then was then only for the.. (13:1626-13:1679)

(2017-06-24 20:44:28) Code: Importance of guidelines {6-0}

(2017-06-24 20:44:28) Quotation: 1:64 it will be useful for us becau.. (14:963-14:1153)

(2017-06-24 20:44:44) Quotation: 1:65 it is of importance that if yo.. (14:353-14:459)

(2017-06-24 20:45:01) Quotation: 1:66 we must also learn this ICTs a..
(14:714-14:797)

(2017-06-24 20:45:39) Quotation: 1:67 ctivity can be broken into pie..
(14:1807-14:1841)

(2017-07-26 19:41:58) Quotation: 1:68 inheritance (1:1753-1:1763)

(2017-07-26 19:42:19) Quotation: 1:69 coming from the informal settl.. (2:493-2:527)

(2017-07-26 19:42:47) Quotation: 1:70 most of them are from Limpopo
(2:1044-2:1072)

(2017-07-26 19:42:56) Quotation: 1:71 they are just living with the .. (2:1167-2:1204)

(2017-07-26 19:43:34) Quotation: 1:72 he absents himself from school..
(2:1601-2:1632)

(2017-07-26 19:44:35) Primary Doc: P 2: School B.pdf {57}

(2017-07-26 19:45:10) Quotation: 2:1 the family background (1:1266-1:1286)

(2017-07-26 19:45:27) Quotation: 2:2 their behavioural problems, (1:1310-1:1338)

(2017-07-26 19:46:00) Quotation: 2:3 learners are doing their fathe.. (1:1909-1:1948)

(2017-07-26 19:46:41) Quotation: 2:4 illiteracy of those parents, m.. (1:2119-1:2192)

(2017-07-26 19:47:20) Quotation: 2:5 from rural areas (2:740-2:755)

(2017-07-26 19:47:38) Quotation: 2:6 phonics, the sounds, (2:1041-2:1060)

(2017-07-26 19:47:49) Quotation: 2:7 poor phonics (2:1091-2:1102)

(2017-07-26 19:48:09) Quotation: 2:8 spelling is very bad (2:1113-2:1132)

(2017-07-26 19:48:48) Quotation: 2:9 stay with the grandparents (2:1924-2:1949)

(2017-07-26 19:49:25) Quotation: 2:10 language barrier (3:1038-3:1053)

(2017-07-26 19:49:45) Quotation: 2:11 coming from the rural areas (3:1401-3:1427)

(2017-07-26 19:50:09) Quotation: 2:12 limited vocabulary of their mo.. (4:56-4:98)

(2017-07-26 19:51:03) Quotation: 2:13 read without comprehending (4:1278-4:1303)

(2017-07-26 19:51:10) Quotation: 2:14 No punctuation (4:1307-4:1320)

(2017-07-26 19:51:22) Quotation: 2:15 they add (4:1517-4:1524)

(2017-07-26 19:51:29) Quotation: 2:16 they omit (4:1532-4:1540)

(2017-07-26 19:51:43) Quotation: 2:17 if they don't understand what .. (4:1543-4:1635)

(2017-07-26 19:52:26) Quotation: 2:18 they don't comprehend (5:219-5:239)

(2017-07-26 19:52:49) Quotation: 2:19 becomes withdrawn (5:673-5:689)

(2017-07-26 19:53:04) Quotation: 2:20 they don't have confidence in .. (5:713-5:754)

(2017-07-26 19:53:10) Quotation: 2:21 end up being very shy (5:765-5:785)

(2017-07-26 19:53:20) Quotation: 2:22 end up not wanting to particip.. (5:846-5:891)

(2017-07-26 19:53:30) Quotation: 2:23 end up not wanting to speak in.. (5:900-5:938)

(2017-07-26 19:53:54) Quotation: 2:24 they can't even follow the ins.. (5:1209-5:1247)

(2017-07-26 19:54:11) Quotation: 2:25 They stay absent and not comin.. (5:1421-5:1462)

(2017-07-26 19:54:35) Quotation: 2:26 they avoid doing the work in c.. (5:1586-5:1670)

(2017-07-26 19:54:48) Quotation: 2:27 most of the time they are outs.. (5:1675-5:1707)

(2017-07-26 19:54:58) Quotation: 2:28 distracting the other learners.. (5:1720-5:1757)

(2017-07-26 19:55:12) Quotation: 2:29 they don't complete whatever t.. (6:9-6:53)

(2017-07-26 19:55:24) Quotation: 2:30 incomplete work. (6:96-6:111)

(2017-07-26 19:55:32) Quotation: 2:31 they even become aggressive (6:170-6:196)

(2017-07-26 19:55:44) Quotation: 2:32 They fail (6:370-6:378)

(2017-07-26 19:55:50) Quotation: 2:33 They are not participating (6:342-6:367)

(2017-08-01 19:19:00) Quotation: 2:34 They don't know to alphabet. (5:4-5:31)

(2017-08-01 19:20:38) Quotation: 2:35 Reading, maybe three times or .. (6:1034-6:1130)

(2017-08-01 19:21:20) Quotation: 2:36 shy or embarrassed (6:1483-6:1500)

(2017-08-01 19:22:04) Quotation: 2:37 go back to grade 1 word, (7:61-7:86)

(2017-08-01 19:22:40) Quotation: 2:38 individual support (7:525-7:542)

(2017-08-01 19:23:10) Quotation: 2:39 teaching the learner sounds, t.. (7:871-7:910)

(2017-08-01 19:23:42) Quotation: 2:40 We use lots of visual aids, we.. (7:955-7:1010)

(2017-08-01 19:23:57) Quotation: 2:41 use flash cards (7:1095-7:1112)

(2017-08-01 19:24:31) Quotation: 2:42 as SBST we have created progra.. (7:1157-7:1212)

(2017-08-01 19:25:16) Quotation: 2:43 computers, we have TVs and rad.. (7:2137-7:2169)

(2017-08-01 19:27:11) Memo: Challenges with ICTs {1-2 Commentary} - Super

(2017-08-01 19:27:11) Quotation: 2:44 they are not enough (7:2218-7:2236)

(2017-08-01 19:31:38) Quotation: 2:45 most of the teachers are prefe.. (8:635-8:684)

(2017-08-01 19:33:01) Memo: Advantages of using tape recorder {1-0 Commentary} - Super

(2017-08-01 19:33:01) Quotation: 2:46 I think it is easy to carry (8:964-8:990)

(2017-08-01 19:36:56) Quotation: 2:47 the computer, playing games, i..
(8:2172-8:2371)

(2017-08-01 19:37:36) Quotation: 2:48 they learn through play (9:550-9:572)

(2017-08-01 19:38:01) Quotation: 2:49 it is repetition (9:625-9:640)

(2017-08-01 19:41:36) Quotation: 2:50 they are able to go there and .. (9:1037-9:1079)

(2017-08-01 19:45:08) Quotation: 2:51 Ja, we do have a policy (9:1427-9:1449)

(2017-08-01 19:45:52) Quotation: 2:52 it is not a policy that comes .. (9:1527-9:1575)

(2017-08-01 19:45:52) Memo: Guidelines {1-0 Commentary} - Super

(2017-08-01 19:47:27) Quotation: 2:53 Ja, we followed the department..
(9:1629-9:1739)

(2017-08-01 19:47:44) Quotation: 2:54 Ja, so we do have that policy .. (9:1757-9:1847)

(2017-08-01 19:49:29) Quotation: 2:55 But like I am saying it is not.. (10:625-10:702)

(2017-08-01 19:50:57) Quotation: 2:56 I would request from the depar..
(10:1600-10:1744)

(2017-08-01 19:53:03) Memo: Recommendations {1-1 Commentary} - Super

(2017-08-01 19:57:05) Quotation: 2:57 It attracts their concentratio.. (12:624-12:654)

(2017-08-01 20:04:03) Primary Doc: P 3: SCHOOL C.docx.pdf {53}

(2017-08-01 20:09:55) Quotation: 3:1 because at home they are speak.. (2:183-2:245)

(2017-08-01 20:10:18) Quotation: 3:2 background where these learner.. (2:380-2:475)

(2017-08-01 20:11:17) Quotation: 3:3 they don't only have that inte.. (2:1096-2:1161)

(2017-08-01 20:12:10) Quotation: 3:4 lack of parental involvement (2:1191-2:1218)

(2017-08-01 20:16:51) Quotation: 3:5 if the parents are not interes.. (2:1221-2:1414)

(2017-08-01 20:16:51) Memo: Contributing factors {1-1 Commentary} - Super

(2017-08-01 20:18:51) Quotation: 3:6 It is a lack of interest. (2:1559-2:1583)

(2017-08-01 20:19:43) Quotation: 3:7 lack of parental involvement (2:2081-2:2108)

(2017-08-01 20:19:55) Quotation: 3:8 illiterate at home (2:2111-2:2128)

(2017-08-01 20:20:42) Quotation: 3:9 kids are coming to school in p.. (3:635-3:748)

(2017-08-01 20:21:06) Quotation: 3:10 sleeping (3:1007-3:1014)

(2017-08-01 20:21:25) Quotation: 3:11 the concentration it won't be .. (3:1237-3:1273)

(2017-08-01 20:21:42) Quotation: 3:12 hunger (3:1292-3:1297)

(2017-08-01 20:23:49) Quotation: 3:13 Another problem is discipline (3:1620-3:1648)

(2017-08-01 20:28:50) Quotation: 3:14 the domestic violence at home (4:21-4:49)

(2017-08-01 20:29:19) Quotation: 3:15 sometimes the problems lies, w.. (4:434-4:502)

(2017-08-01 20:30:08) Quotation: 3:16 most of the teachers when they..

(4:908-4:1078)

(2017-08-01 20:32:00) Quotation: 3:17 he breaks words (4:1629-4:1643)

(2017-08-01 20:32:26) Quotation: 3:18 Sometimes it takes him time to..

(4:1709-4:1763)

(2017-08-01 20:34:37) Quotation: 3:19 They are using guess word, the..

(4:2155-4:2198)

(2017-08-01 20:35:02) Quotation: 3:20 just read without understandin..

(4:2281-4:2311)

(2017-08-01 20:35:38) Quotation: 3:21 they swallow up some of the wo.. (5:47-5:79)

(2017-08-01 20:36:05) Quotation: 3:22 Omission of words (5:192-5:208)

(2017-08-01 20:36:41) Quotation: 3:23 or add words that are not ther.. (5:491-5:521)

(2017-08-01 20:39:28) Quotation: 3:24 they listen to what the other .. (5:676-5:814)

(2017-08-01 20:42:35) Quotation: 3:25 They won't achieve (5:2245-5:2262)

(2017-08-01 20:46:45) Quotation: 3:26 oral reading. They all come to.. (6:1387-6:1434)

(2017-08-01 20:47:32) Quotation: 3:27 creating some game, where a le..

(6:1788-6:1924)

(2017-08-01 20:52:20) Quotation: 3:28 by group reading (7:583-7:600)

(2017-08-03 20:29:08) Quotation: 3:29 picture reading (7:900-7:916)

(2017-08-03 20:34:21) Quotation: 3:30 Letalend (7:1809-7:1816)

(2017-08-03 20:35:01) Memo: Support Programme {1-0 Commentary} - Super

(2017-08-03 20:36:10) Quotation: 3:31 They start from storytelling, ..

(8:226-8:397)

(2017-08-03 20:38:44) Quotation: 3:32 build a word coming from that ..

(8:1162-8:1198)

(2017-08-03 20:39:25) Quotation: 3:33 give them a story, where they ..

(8:1739-8:1855)

(2017-08-03 20:40:16) Quotation: 3:34 with the use of the charts, yo.. (9:9-9:193)

(2017-08-03 20:41:28) Quotation: 3:35 pair reading (9:1566-9:1577)

(2017-08-03 20:42:11) Quotation: 3:36 using flash cards (9:2089-9:2105)

(2017-08-03 20:42:56) Quotation: 3:37 projector (10:1044-10:1052)

(2017-08-03 20:43:17) Quotation: 3:38 Computers (10:1234-10:1242)

(2017-08-03 20:43:28) Quotation: 3:39 Radio, TV (10:1269-10:1277)

(2017-08-03 20:43:41) Quotation: 3:40 tape recorder (10:1313-10:1325)

(2017-08-03 20:44:03) Quotation: 3:41 video (10:1603-10:1607)

(2017-08-03 20:44:40) Quotation: 3:42 the moment they see that proje.. (11:24-11:90)

(2017-08-03 20:45:20) Quotation: 3:43 They enjoy their computer clas.. (11:695-11:727)

(2017-08-03 20:45:44) Quotation: 3:44 there is a lot of improvement (11:1031-11:1059)

(2017-08-03 20:46:18) Quotation: 3:45 especially the listening skill.. (11:1062-11:1228)

(2017-08-03 20:47:04) Quotation: 3:46 the computer is mostly communi.. (11:1797-11:1848)

(2017-08-03 20:47:38) Quotation: 3:47 Yes, we do have the ICT policy.. (12:368-12:397)

(2017-08-03 20:48:12) Quotation: 3:48 We do, with the changes that w.. (12:518-12:696)

(2017-08-03 20:48:50) Quotation: 3:49 TV, the radio, camera, cell ph.. (12:1080-12:1198)

(2017-08-03 20:49:22) Quotation: 3:50 our phones are, can record stu.. (12:1251-12:1357)

(2017-08-03 20:50:28) Quotation: 3:51 our phones are, can record stu.. (12:1251-12:1511)

(2017-08-03 20:51:18) Quotation: 3:52 show them a video on your phon.. (12:1651-12:1681)

(2017-08-03 20:52:16) Quotation: 3:53 these things we must first che.. (13:285-13:328)

(2017-08-05 10:12:36) Primary Doc: P 4: SCHOOL D.docx.pdf {35}

(2017-08-05 10:13:02) Quotation: 4:1 Language barrier (1:93-1:108)

(2017-08-05 10:13:14) Quotation: 4:2 Lack of parental involvement (1:113-1:140)

(2017-08-05 10:13:25) Quotation: 4:3 Lack of exposure to reading ma.. (1:145-1:180)

(2017-08-05 10:13:40) Quotation: 4:4 Socio-economic issues – parent.. (1:185-1:249)

(2017-08-05 10:14:10) Quotation: 4:5 Word recognition (1:345-1:360)

(2017-08-05 10:14:19) Quotation: 4:6 Phonetics (1:365-1:373)

(2017-08-05 10:14:34) Quotation: 4:7 Phonemic awareness (1:378-1:395)

(2017-08-05 10:14:42) Quotation: 4:8 Work attack skills (1:400-1:417)

(2017-08-05 10:14:51) Quotation: 4:9 Limited vocabulary (1:422-1:439)

(2017-08-05 10:15:27) Quotation: 4:10 Frustration (1:557-1:567)

(2017-08-05 10:15:36) Quotation: 4:11 Disturb other learners (1:572-1:593)

(2017-08-05 10:16:49) Quotation: 4:12 Negative attitude towards lear.. (1:598-1:631)

(2017-08-05 10:16:56) Quotation: 4:13 Lack of concentration (1:636-1:656)

(2017-08-05 10:17:05) Quotation: 4:14 Failure of most of the subject.. (1:661-1:691)

(2017-08-05 10:17:12) Quotation: 4:15 Unable to express themselves (1:696-1:723)

(2017-08-05 10:17:18) Quotation: 4:16 Lack of confidence (1:728-1:745)

(2017-08-05 10:17:25) Quotation: 4:17 One drop out this year (1:750-1:772)

(2017-08-05 10:17:43) Quotation: 4:18 Through baseline time (1:857-1:877)

(2017-08-05 10:17:54) Quotation: 4:19 Informal reading test (1:882-1:902)

(2017-08-05 10:18:08) Quotation: 4:20 Continuous assessment tasks (1:907-1:933)

(2017-08-05 10:18:17) Quotation: 4:21 Recently using SIAS methods of.. (1:938-1:977)

(2017-08-05 10:18:40) Quotation: 4:22 Grouping learners with similar.. (1:1061-1:1141)

(2017-08-05 10:18:50) Quotation: 4:23 Using flash cards (1:1146-1:1162)

(2017-08-05 10:20:38) Quotation: 4:24 previous grade's reading mater.. (1:1202-1:1234)

(2017-08-05 10:22:07) Quotation: 4:25 Computers (1:1603-1:1611)

(2017-08-05 10:22:15) Quotation: 4:26 Tape recorders (1:1616-1:1629)

(2017-08-05 10:22:25) Quotation: 4:27 DVD and video players (1:1634-1:1654)

(2017-08-05 10:22:36) Quotation: 4:28 Laptops (1:1659-1:1665)

(2017-08-05 10:22:49) Quotation: 4:29 TVs (2:3-2:5)

(2017-08-05 10:23:15) Quotation: 4:30 Computers (2:143-2:151)

(2017-08-05 10:24:02) Quotation: 4:31 there was no enough time for t.. (2:162-2:271)

(2017-08-05 10:24:02) Memo: Effectiveness of ICTs {1-0 Commentary} - Super

(2017-08-05 10:24:30) Quotation: 4:32 laptop (2:294-2:300)

(2017-08-05 10:24:43) Quotation: 4:33 The learners become more inter.. (2:385-2:419)

(2017-08-05 10:24:53) Quotation: 4:34 participation is enhanced (2:431-2:457)

(2017-08-05 10:25:19) Quotation: 4:35 do not have any policy/guideli.. (2:613-2:655)

(2017-08-14 19:19:33) Primary Doc: P 5: SCHOOL E.pdf {85}

(2017-08-14 19:20:06) Quotation: 5:1 Language (2:930-2:937)

(2017-08-14 19:20:28) Quotation: 5:2 pronunciation (2:1562-2:1574)

(2017-08-14 19:20:55) Quotation: 5:3 poor word recognition (3:469-3:489)

(2017-08-14 19:21:15) Quotation: 5:4 Language (3:855-3:862)

(2017-08-14 19:21:20) Quotation: 5:5 pronunciation. (3:872-3:885)

(2017-08-14 19:21:37) Quotation: 5:6 a learner is sent to grade 1 t.. (3:1148-3:1187)

(2017-08-14 19:22:04) Quotation: 5:7 not exposed to books at school.. (4:43-4:83)

(2017-08-14 19:22:14) Quotation: 5:8 The parents don't read to them.. (4:87-4:116)

(2017-08-14 19:22:28) Quotation: 5:9 It is the TV that they are exp.. (4:214-4:264)

(2017-08-14 19:22:50) Quotation: 5:10 learners read through without .. (4:701-4:749)

(2017-08-14 19:23:05) Quotation: 5:11 pronunciation (4:870-4:882)

(2017-08-14 19:23:11) Quotation: 5:12 don't know how to comprehend (4:826-4:853)

(2017-08-14 19:23:25) Quotation: 5:13 they cannot understand what th..
(4:1070-4:1115)

(2017-08-14 19:23:36) Quotation: 5:14 They with draw the words (4:1211-4:1234)

(2017-08-14 19:23:44) Quotation: 5:15 they don't understand what the..
(4:1282-4:1326)

(2017-08-14 19:23:57) Quotation: 5:16 they omit (4:1680-4:1688)

(2017-08-14 19:24:07) Quotation: 5:17 They omit (4:1875-4:1883)

(2017-08-14 19:24:13) Quotation: 5:18 add words (4:1922-4:1930)

(2017-08-14 19:24:46) Quotation: 5:19 memory of sounds (5:238-5:253)

(2017-08-14 19:24:59) Quotation: 5:20 memory to recognise certain so.. (5:296-5:329)

(2017-08-14 19:25:04) Quotation: 5:21 recall information (5:335-5:352)

(2017-08-14 19:25:31) Quotation: 5:22 unable to put the word togethe.. (5:660-5:692)

(2017-08-14 19:25:45) Quotation: 5:23 they can't decode (5:787-5:803)

(2017-08-14 19:25:52) Quotation: 5:24 dyslexia (5:931-5:938)

(2017-08-14 19:26:04) Quotation: 5:25 they read from the right to th.. (5:1148-5:1186)

(2017-08-14 19:26:23) Quotation: 5:26 reading from one side (5:1071-5:1091)

(2017-08-14 19:26:40) Quotation: 5:27 can't see the sentences in the..
(5:1637-5:1682)

(2017-08-14 19:27:03) Quotation: 5:28 don't know how to speak the la..
(5:1963-5:2000)

(2017-08-14 19:27:18) Quotation: 5:29 there is not a wide vocabulary..
(5:2086-5:2115)

(2017-08-14 19:27:27) Quotation: 5:30 cannot decode words (6:24-6:42)

(2017-08-14 19:27:35) Quotation: 5:31 lack of their phonic knowledge.. (6:55-6:84)

(2017-08-14 19:27:47) Quotation: 5:32 omitting (6:139-6:146)

(2017-08-14 19:27:53) Quotation: 5:33 putting in their own words (6:152-6:177)

(2017-08-14 19:28:16) Quotation: 5:34 add that word (6:585-6:600)

(2017-08-14 19:28:43) Quotation: 5:35 cannot complete the tasks (6:1344-6:1368)

(2017-08-14 19:28:52) Quotation: 5:36 struggle in the learning areas.. (6:1382-6:1411)

(2017-08-14 19:28:59) Quotation: 5:37 poor marks (6:1428-6:1437)

(2017-08-14 19:29:11) Quotation: 5:38 it affects their self-esteem (6:1467-6:1494)

(2017-08-14 19:29:19) Quotation: 5:39 they start to lose confidence (6:1558-6:1586)

(2017-08-14 19:29:25) Quotation: 5:40 drop out (6:1639-6:1646)

(2017-08-14 19:29:37) Quotation: 5:41 marks fal (6:1709-6:1717)

(2017-08-14 19:29:54) Quotation: 5:42 not comprehending what they ar..
(6:1926-6:1964)

(2017-08-14 19:30:16) Quotation: 5:43 really frustrates a learner (6:2131-6:2157)

(2017-08-14 19:30:46) Quotation: 5:44 you give them a book, or a pag.. (7:399-7:501)

(2017-08-14 19:30:53) Quotation: 5:45 we use flash cards (7:524-7:541)

(2017-08-14 19:31:25) Quotation: 5:46 can't spell three sounds, thre.. (7:686-7:729)

(2017-08-14 19:31:43) Quotation: 5:47 spelling tests (7:759-7:772)

(2017-08-14 19:31:59) Quotation: 5:48 do it profiler (7:977-7:990)

(2017-08-14 19:32:40) Quotation: 5:49 do it profiler, it is a comput.. (7:977-7:1240)

(2017-08-14 19:32:40) Memo: identification {1-0 Commentary} - Super

(2017-08-14 19:33:15) Quotation: 5:50 frustration (7:1814-7:1824)

(2017-08-14 19:33:38) Quotation: 5:51 assess all learners with LSEN .. (8:109-8:145)

(2017-08-14 19:34:10) Quotation: 5:52 one to one (8:1520-8:1529)

(2017-08-14 19:34:22) Quotation: 5:53 I will start off with the alph.. (8:1552-8:1585)

(2017-08-14 19:34:31) Quotation: 5:54 correct pronunciation (8:1638-8:1658)

(2017-08-14 19:34:54) Quotation: 5:55 introducing the words, prefera..
(8:1856-8:1905)

(2017-08-14 19:35:14) Quotation: 5:56 Peer reading (8:2238-8:2249)

(2017-08-14 19:35:19) Quotation: 5:57 group reading (8:2256-8:2268)

(2017-08-14 19:35:33) Quotation: 5:58 use illustrations like picture.. (9:83-9:116)

(2017-08-14 19:35:43) Quotation: 5:59 incidental reading (9:232-9:249)

(2017-08-14 19:35:50) Quotation: 5:60 use side words (9:300-9:313)

(2017-08-14 19:36:06) Quotation: 5:61 use more simple text. (9:819-9:839)

(2017-08-14 19:36:18) Quotation: 5:62 I will read the word and subse.. (9:871-9:922)

(2017-08-14 19:36:29) Quotation: 5:63 Letter lands (9:1014-9:1025)

(2017-08-14 19:36:47) Quotation: 5:64 I encourage my learners to rea..
(9:1246-9:1388)

(2017-08-14 19:37:01) Quotation: 5:65 auditory programme (10:175-10:192)

(2017-08-14 19:37:33) Quotation: 5:66 through singing (10:783-10:797)

(2017-08-14 19:38:19) Quotation: 5:67 encourage parental involvement..
(10:1386-10:1415)

(2017-08-14 19:38:33) Quotation: 5:68 draw the words (10:1557-10:1572)

(2017-08-14 19:38:54) Quotation: 5:69 Laptops (11:118-11:124)

(2017-08-14 19:38:59) Quotation: 5:70 projectors (11:127-11:136)

(2017-08-14 19:39:10) Quotation: 5:71 TV (11:317-11:318)

(2017-08-14 19:39:18) Quotation: 5:72 Whiteboard (11:325-11:334)

(2017-08-14 19:39:26) Quotation: 5:73 CD player (11:424-11:432)

(2017-08-14 19:39:42) Quotation: 5:74 cell phone (11:793-11:802)

(2017-08-14 19:40:04) Quotation: 5:75 cell phone (11:1166-11:1175)

(2017-08-14 19:40:19) Quotation: 5:76 Laptop (12:89-12:94)

(2017-08-14 19:40:36) Quotation: 5:77 scan (12:225-12:228)

(2017-08-14 19:41:02) Quotation: 5:78 projector (12:554-12:562)

(2017-08-14 19:41:13) Quotation: 5:79 smart board (12:764-12:774)

(2017-08-14 19:41:45) Quotation: 5:80 They are more interested (12:1540-12:1563)

(2017-08-14 19:42:05) Quotation: 5:81 prefers it (13:168-13:177)

(2017-08-14 19:42:28) Quotation: 5:82 Interactive with the children (13:675-13:703)

(2017-08-14 19:43:24) Quotation: 5:83 It is an oversight (14:478-14:495)

(2017-08-14 19:43:46) Quotation: 5:84 we need some kind of a framewo..
(14:883-14:955)

(2017-08-14 19:44:16) Quotation: 5:85 parents in my class who are il..
(14:1719-14:1758)

APPENDIX O: PART OF QUAN EXCEL

PARTICIPANT	QA1: DESIGNATION	QA2: GENDER	QA3: AGE	QA4: POST LEVEL	QA5: QUALIFICATION	QA6: YEARS OF EXPERIENCE	QA7: PERIODS PER WEEK	QA8: TRAINING	QA9: SCHOOL	QA10: NUMBER OF LEARN	QBA1: % OF LEARN	QBA2: % OF LEARN
1	2	1	43	1	3	14	40	0	1	250	1	4
2	1	1	45	1	3	30		0	1	250	1	5
3	1	1	55	1	1			0	1	250	1	5
4	1	1	40	1	3	12	45	0	1	250	1	5
5	1	2	46	2	3	20	38	0	1	250	1	5
6	1	1	49	1	2	10		0	1	250	4	5
7	1	1	45	1	2	17		2	1	250	4	5
8	1	1	55	2	2	24	24	4	1	250	3	3
9	2	1	46	1	3	10	40	0	1	250	1	5
10	1	1		1	2			0	1	250	2	3
11	1	1	48	1	3	16	48	1	1	96	2	3
12	1	1	54	1	3	20	50	1	1	96	2	2
13	1	1	24	1	2	2	46	0	1	96	1	1
14	1	2	41	2	3	14	40	3	1	96	4	3
15	1	1	58	1	1	17	40	0	1	96	2	3
16	2	1	57	1	3	9	35	3	1	96	3	5
17	1	1	25	1	2	2	48	0	1	96	1	2
18	1	2	47	1	3	18	40	3	1	98	3	4
19	1	1		1	3	7		4	1	150	3	1
20	1	1		1	2	7	10	0	1	150	1	4
21	1	1	26	1	2	5	10	4	1	150	1	4
22	1	1	43	1	3	11		0	1	150	2	3
23	1	1	33	1	2	11	52	0	1	150	1	4

PARTICIPANT	QA1: DESIGNATION	QA2: GENDER	QA3: AGE	QA4: POST LEVEL	QA5: QUALIFICATION	QA6: YEARS OF EXPERIENCE	QA7: PERIODS PER YEAR	QA8: TRAINING	QA9: SCHOOL	QA10: NUMBER OF LEARN	QBA1: % OF LEARN	QBA2: % OF LEARN
24	1	1	61	2	2	18	30	0	1	150	3	5
25	1	1		1	2	22	53	5	1	150	3	4
26	1	1	31	1	5	3	53	0	1	150	2	1
27	1	1	41	1	1	18	11	3	1	150	2	2
28	2	1	59	1	5	39		0	1	150	1	2
29	2	1	39	1	3	15	34	0	2	215	2	2
30	2	1	53	1	5	31	27	0	1	225	2	5
31	1	1	38	2	2	8	38	2	2	100	1	4
32	1	1		1	1	17	45	0	2	215	1	2
33	1	1		1	1	25	45	1	2	215	1	2
34	1	1		1	1	16	45	1	2	215	1	2
35	1	1	25	1	4	2	22	0	1	215	4	2
36	2	1	47	1	3	16	55	2	1	215	4	3
37	2	1	47	1	3	20	55	2	1	215	4	2
38	1	2	39	1	2	3	36	2	1	215	3	3
39	1	2	52	2	3	20	30	0	1	111	3	3
40	1	1	34	1	2	7	20	0	1	200	3	4
41	1	1		2	3	22	6	0	1	200	1	1
42	1	1	27	1	2	4	37	1	1	200	1	4
43	2	1	29	1	3	8	20	1	1	200	3	3
44	1	1	28	1	2	1	6	0	1	200	3	2
45	1	1	59	1	2	38	6	0	1	200	1	1
46	1	1	53	1	2	30	39	0	1	200	2	3
47	1	1	46	1	2	22	23	0	1	200	2	3

APPENDIX P: ACTUAL CODES PER THEME

Codes-quotations list

Code-Filter: All

HU: Coding working

File: [C:\Users\shila\Desktop\Coding working.hpr7]

Edited by: Super

Date/Time: 2018-01-27 19:28:17

Code: Adapted curriculum {0-1}

Code: Auditory programme {0-1}

Code: Available ICTs {22-0}

P 1: School A.pdf - 1:54 [white boards, we have projecto..] (11:1448-11:1479) (Super)

Codes: [Available ICTs]

No memos

white boards, we have projectors

P 1: School A.pdf - 1:55 [computers] (11:1503-11:1511) (Super)

Codes: [Available ICTs]

No memos

computers

P 1: School A.pdf - 1:56 [Laptops] (11:1563-11:1569) (Super)

Codes: [Available ICTs]

No memos

Laptops

P 1: School A.pdf - 1:57 [they use the tablets] (11:1659-11:1678) (Super)

Codes: [Available ICTs]

No memos

they use the tablets

P 1: School A.pdf - 1:58 [televisions and radios] (11:1748-11:1769) (Super)

Codes: [Available ICTs]

No memos

televisions and radios

P 2: School B.pdf - 2:43 [computers, we have TVs and rad..] (7:2137-7:2169) (Super)

Codes: [Available ICTs]

No memos

computers, we have TVs and radios

P 3: SCHOOL C.docx.pdf - 3:37 [projector] (10:1044-10:1052) (Super)

Codes: [Available ICTs]

No memos

projector

P 3: SCHOOL C.docx.pdf - 3:38 [Computers] (10:1234-10:1242) (Super)

Codes: [Available ICTs]

No memos

Computers

P 3: SCHOOL C.docx.pdf - 3:39 [Radio, TV] (10:1269-10:1277) (Super)

Codes: [Available ICTs]

No memos

Radio, TV

P 3: SCHOOL C.docx.pdf - 3:40 [tape recorder] (10:1313-10:1325) (Super)

Codes: [Available ICTs]

No memos

tape recorder

P 3: SCHOOL C.docx.pdf - 3:41 [video] (10:1603-10:1607) (Super)

Codes: [Available ICTs]

No memos

video

P 4: SCHOOL D.docx.pdf - 4:25 [Computers] (1:1603-1:1611) (Super)

Codes: [Available ICTs]

No memos

Computers

P 4: SCHOOL D.docx.pdf - 4:26 [Tape recorders] (1:1616-1:1629) (Super)

Codes: [Available ICTs]

No memos

Tape recorders

P 4: SCHOOL D.docx.pdf - 4:27 [DVD and video players] (1:1634-1:1654) (Super)

Codes: [Available ICTs]

No memos

DVD and video players

P 4: SCHOOL D.docx.pdf - 4:28 [Laptops] (1:1659-1:1665) (Super)

Codes: [Available ICTs]

No memos

Laptops

P 4: SCHOOL D.docx.pdf - 4:29 [TVs] (2:3-2:5) (Super)

Codes: [Available ICTs]

APPENDIX Q: CO-CODED RESULT

Codes-quotations list

Code-Filter: All

HU: analysi

File: [C:\Users\Shila\Desktop\analysi.hpr7]

Edited by: Super

Date/Time: 2016-02-11 14:50:07

Code: Adressing learners needs {1-0}

P 3: Transcription.pdf - 3:3 [Okay. So how do you deal with ..] (1:984-1:1094) (Super)

Codes: [Adressing learners needs] [First question]

No memos

Okay. So how do you deal with the needs of all learners experiencing reading difficulties in your classroom?

Code: First question {1-0}

P 3: Transcription.pdf - 3:3 [Okay. So how do you deal with ..] (1:984-1:1094) (Super)

Codes: [Adressing learners needs] [First question]

No memos

Okay. So how do you deal with the needs of all learners experiencing reading difficulties in your classroom?

Code: Identifying learners needs {1-0}

P 3: Transcription.pdf - 3:4 [Mm. Maybe if I can go back a l..] (1:1841-1:2034) (Super)

Codes: [Identifying learners needs]

No memos

Mm. Maybe if I can go back a little bit before I can go to the next question to say, how are these learners identified? How now do you say, this learner is experiencing reading difficulties?

Code: Introduction {1-0}

P 3: Transcription.pdf - 3:1 [I came - uh - as we - I've int..] (1:18-1:266) (Super)

Codes: [Introduction]

No memos

I came - uh - as we - I've introduced myself that my name is X. I'm doing a study on ICT

as a support mechanism for learners experiencing reading difficulties. I will just like you

briefly to explain your designation and what basically you are doing

Code: Participants introduction {1-0}

**P 3: Transcription.pdf - 3:2 [Alright. I'm . Um - However no..] (1:272-1:978)
(Super)**

Codes: [Participants introduction]

No memos

Alright. I'm . Um - However not my full names. It's stated on the form as X and obviously it's also me. A learning support educator district X. I deal with a lot of learners with barriers to learning especially - uh - learners with barriers to reading due to

the fact that they don't learn in their - um - first language which normally causes reading barriers.

Um - in alleviating these barriers we resort to various methods and various techniques. Although I don't work with a learner on a one-on-one basis I do observe the learner in class and as well as a one-on-one basis in order to - um - to get down to the bottom of it

and afterwards we support teachers in order to support learners

Code: Response to identifying needs {1-0}

**P 3: Transcription.pdf - 3:5 [Mhm. Ja. In the foundation pha..] (1:2039-2:4)
(Super)**

Codes: [Response to identifying needs]

No memos

Mhm. Ja. In the foundation phase it's - it's pretty much different to the ... phase. I'll only

focus on - on the ... phase um - because I think your study more - pertains more to the ... ph

APPENDIX R: CODING MATRIX

CODES-PRIMARY-DOCUMENTS-TABLE						
Report created by Super - 2017/08/28 11:57:14 PM						
HU: [C:\Users\shila\Desktop\Coding 2.hpr7]						
Code-Filter: All [9]						
PD-Filter: All [5]						
Quotation-Filter: All [302]						
	P 1: Scho ol A.pdf	P 2: Scho ol B.pdf	P 3: SCHOO L C.docx. pdf	P 4: SCHOO L D.docx. pdf	P 5: SCHO OL E.pdf	TOTAL S:
Available ICTs	5	1	5	5	6	22
Contributing factors	19	6	13	4	9	51
Effects of reading difficulties	9	17	3	8	9	46
Guidelines	1	4	1	1	2	9
Identifying learners experiencing reading difficulties	5	0	4	4	5	18
Importance of guidelines	3	0	3	0	0	6
Most effective ICTs	4	6	8	4	8	30
Support strategies	19	7	7	3	17	53
Types of reading difficulties	7	12	8	5	28	60
TOTALS:	72	53	52	34	84	295

APPENDIX S: READING-SUPPORT TIMETABLE

READING-SUPPORT SESSIONS TIME TABLE

2017

TIME	8:00-8:30	8:30-9:00	9:00-9:30	9:30-10:00	10:00-10:30	10:30-11:00	11:00-11:30	11:30-12:00	12:00-12:30	12:30-13:00	13:00-13:30	13:30-14:00
MONDAY	1A	1B	1C	5A	2A	B	R	4B	5B	2B	2C	6A
TUESDAY	2A	2B	2C	4B	3A	R	3B	1B	1C	1A		5A
WEDNESDAY	5B	5A	R	4A	4A	E	PARENTAL CONSULTATION					
THURSDAY	4A	R	4B	4B	4B	A	RECORDING				6B	6C
FRIDAY	7B	4A	1A	1B	7A&B	K	1C	3A	3B	7B	FILING	

APPENDIX T: LANGUAGE EDITING CERTIFICATE



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Website: www.jaybe9.wix.com/bluediamondsed

8 May 2018

Declaration of professional edit

INFORMATION COMMUNICATION TECHNOLOGIES AS A SUPPORT MECHANISM FOR LEARNERS
EXPERIENCING READING DIFFICULTIES IN FULL-SERVICE SCHOOLS

by

RAMASHEGO SHILA SHORTY MPHAHLELE

I declare that I have edited and proofread this thesis. My involvement was restricted to language usage and spelling, completeness and consistency, referencing style and formatting of headings, captions and Tables of Contents. I did no structural re-writing of the content.

I am qualified to have done such editing, being in possession of a Bachelor's degree with a major in English, having taught English to matriculation, and having a Certificate in Copy Editing from the University of Cape Town. I have edited more than 100 Masters and Doctoral theses, as well as articles, books and reports.

As the copy editor, I am not responsible for detecting, or removing, passages in the document that closely resemble other texts and could thus be viewed as plagiarism. I am not accountable for any changes made to this document by the author or any other party subsequent to my edit.

Sincerely,



Dr Jacqueline Baumgardt
Full Member, Professional Editors Guild

APPENDIX U: STATISTICAL ANALYSIS CONFIRMATION LETTER

Verification of statistical analysis and interpretation of the quantitative data

Date: 25-01-2018

This is to verify that the statistical components (the quantitative data analyses, results and interpretation sections) of the doctoral study undertaken
by

Mrs Shila Mphahlele, with the thesis entitled

***Information communication technologies (ICTs) as a support mechanism for learners
experiencing reading difficulties in full service schools***

has been checked, edited and verified for the applicability of statistical analysis techniques, proper presentation of analysis results, correct interpretation thereof and write-up of deductions derived from the quantitative analysis results.



Dr Hélène Müller,
Statistical Services, Statistician (quant. research support)
*D Ed (statistical support); Hons (mathematical Statistic), HOD, Dipl. Data-metrics, BSc
Research Fellow, College of Education, School of Teacher Education, Unisa*

APPENDIX V: TURNITIN CONFIRMATION LETTER

Document Viewer					
Turnitin Originality Report Processed on: 16-11-2016 12:10 SAST ID: 80007123 Word Count: 53511 Submitted: 1					
Information Communication Technologies as a s... By S Mphahlele					
3% match (Inferred from: 28 Apr-2016) http://turnitina.co.za					
INFORMATION COMMUNICATION TECHNOLOGIES AS A SUPPORT MECHANISM FOR LEARNERS EXPERIENCING READING DIFFICULTIES IN FULL SERVICE SCHOOLS^a by RAMASHEGO SHITLA SHOKUYI MPHHALELE Submitted in fulfillment of accordance with the of the requirements for the degree of DOCTOR EDUCATIONIS (in) in the subject of PSYCHOLOGY OF EDUCATION in at the COLLEGE OF EDUCATION at the UNIVERSITY OF SOUTH AFRICA SUPERVISOR: PROF N.M. NFI JANUARY 2015 Table of Contents CHAPTER 1	<table border="1"> <thead> <tr> <th>Similarity Index</th> <th>Similarity by Source</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td> Internet Sources: 7% Published: 6% Self-submitted: 2% </td> </tr> </tbody> </table>	Similarity Index	Similarity by Source	3%	Internet Sources: 7% Published: 6% Self-submitted: 2%
Similarity Index	Similarity by Source				
3%	Internet Sources: 7% Published: 6% Self-submitted: 2%				
1.1 INTRODUCTION TO THE STUDY 1.1.2 BACKGROUND TO THE STUDY 2.1.2.1 Current status of reading difficulties globally 3.1.2.2 Status of reading difficulties in the sub-Saharan Africa 4.1.2.3 The situation of reading difficulties in South Africa 5.1.2.4 Inclusive Education: Supporting learners experiencing reading difficulties 8 1.3 LITERATURE REVIEW 11 1.3.1 Vygotsky socio-cultural theory: Zone of Proximal Development 12 1.3.2 Readers Response theory 13 1.3.3 E-Reading theory 13 1.4 PROBLEM STATEMENT 15 1.5 RESEARCH QUESTIONS AND HYPOTHESES 15 1.5.1 The main research question 15 1.5.2 Secondary research questions 15 1.5.3 Hypotheses 16 1.6 AIM AND OBJECTIVES 16 1.7 RESEARCH METHODOLOGY 17 1.7.1 Research paradigm 18 1.7.2 Research approach 20 1.7.3 Research design 21 1.7.4 Research methods: procedures, data collection tools and data analysis 23 1.7.4.1 Population and sample size 23 1.7.4.2 Data collection 24 1.7.4.3 Data 24					